Meeting Agenda
August 11, 2026
11:00 a.m. – 1:00 p.m.

Location: Metropolitan Water District of Southern California (MWD)
Grace F. Napolitano Pure Water Southern California Innovation Center
24501 S. Figueroa Street, Carson, CA 90745

For virtual participation, please connect to the Zoom meeting at 11:30 a.m.
https://zoom.us/j/7606690554?pwd=zn147RteBJUSo0LIPgkbnbwo76mM9H.1&omn=98804586098
Meeting ID: 760 669 0554
Passcode: 076112

The mission of Los Angeles Chapter of the WateReuse Association is to enhance the resiliency and sustainability of Los Angeles County by increasing the safe, beneficial use of recycled water. Its objectives shall be to promote water reclamation and recycling as a sustainable supplemental source of water for the state; to work for the adoption of legislation and regulations that allow the safe use of recycled water; to facilitate the development of technology aimed at improving water recycling; to promote legislation that would increase funding for water recycling projects; to provide mutual assistance and support between and among Chapter members involved with water recycling projects; and to increase public awareness and understanding of related water problems and solutions.

Lunch…… 11:00 a.m.

Welcome, Introductions and Instructions…… 11:30 a.m.

1. Host Presentation: Pure Water Southern California (PWSC) (*Matthew Hacker, MWD*)
2. Sponsor Presentation: An Overview of Operational Data Reporting Strategies and Visualization using PowerBI (Jim Vickers*, Brown and Caldwell*)
3. Technical Presentation: CalVal: A Journey towards More Straightforward IPR Treatment Validation and Regulatory Compliance (*Jason Dadakis, OCWD)*
4. Water Recycling Legislative/Regulatory Updates (*Phillip Vander Klay, LACSD*)
5. California State Section Update *(Rafael Villegas)*
6. Chapter Updates *(Seto Cherchian)*
7. Membership Roundtable *(Jennifer Jacobus)*
8. Next Meetings
   - October 13, 2026 – (TBD)
   - December 8, 2026 – (TBD)
9. Adjournment …… 1:00 p.m.
10. Tour: MWD's PWSC Innovation Center's Demonstration Plant…… 1:05 p.m.

Los Angeles Chapter Officers for 2025/2026

Jennifer Jacobus, President	213-448-2586	jjacobus@rinconconsultants.com
Everett Ferguson, Vice President	562-275-4241	eferguson@wrd.org
Seto Cherchian, Secretary/Treasurer	213-217-6297	scherchian@mwdh2o.com
Rafael Villegas, Chapter Trustee	213-367-1289	rafael.villegas@ladwp.com
Jared Lee, Past President	626-379-8443	jared.lee@SCE.com

Pure Water Southern California

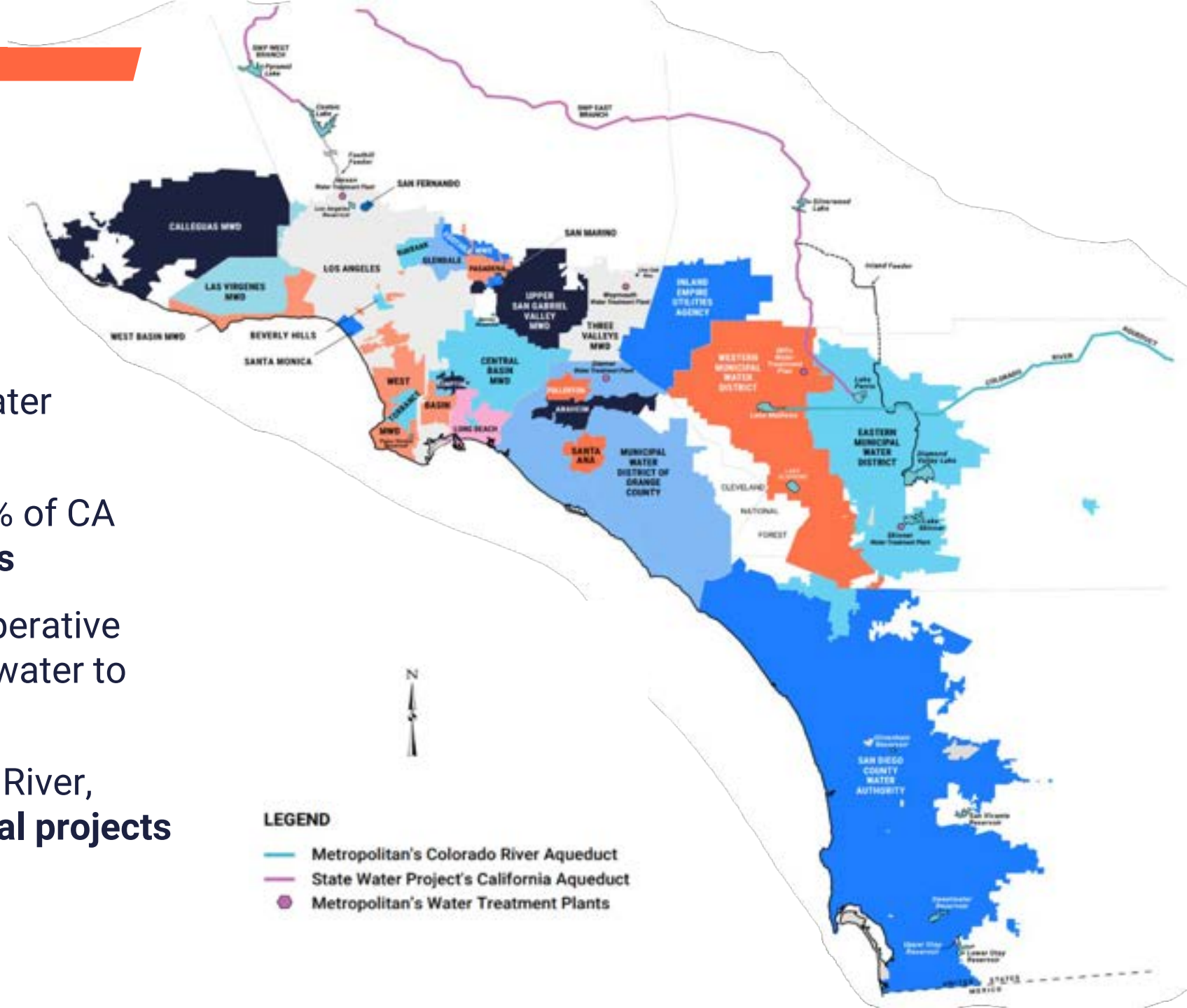
Welcome WateReuse LA Chapter!

August 11, 2026

PUREWATER SOUTHERN CALIFORNIA

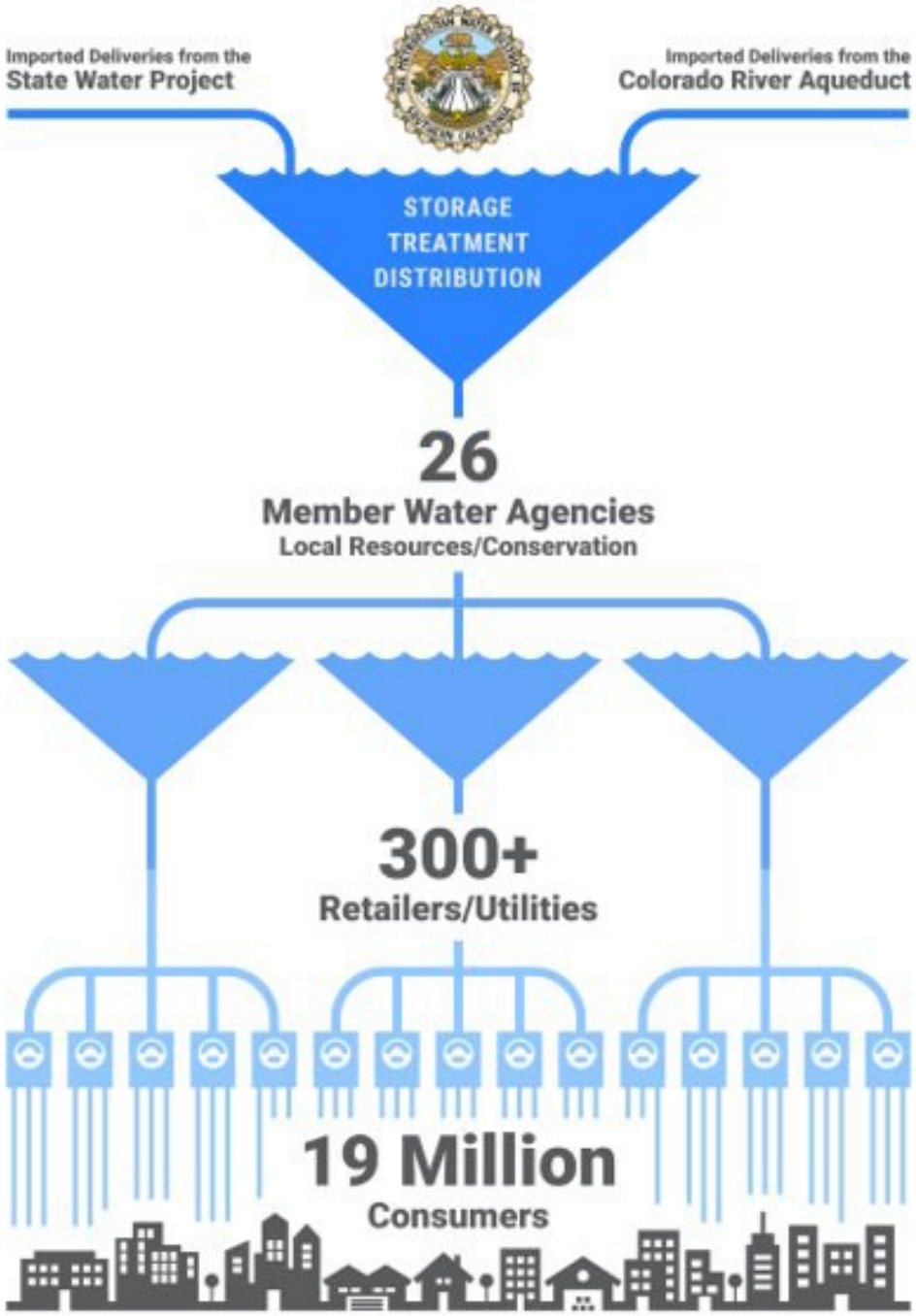
Metropolitan Overview

- Nation's **largest** wholesale water provider
- **Serves 19 million people** (48% of CA population!) across **6 counties**
- Established in **1928** as a cooperative between cities to bring more water to SoCal
- **Imports water** from Colorado River, Northern Sierra, invests in **local projects & conservation**



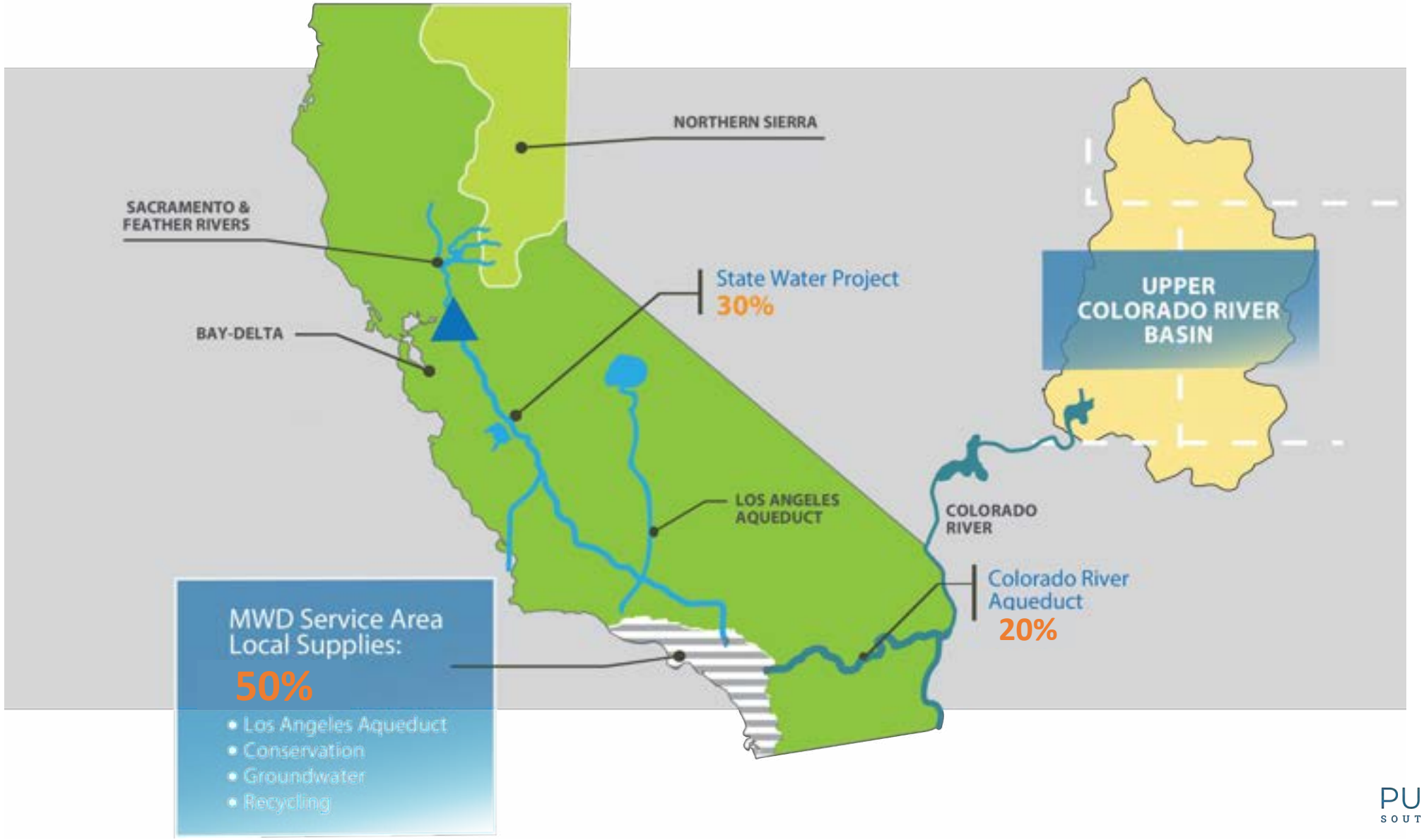
Metropolitan Overview

- Governed by a **38-member board** from **26 public water agencies**
- **300+ retailers/utilities**
- Known as a **special district**



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Sources of Water in Southern California



PUREWATER SOUTHERN CALIFORNIA

Impacts of Climate Change







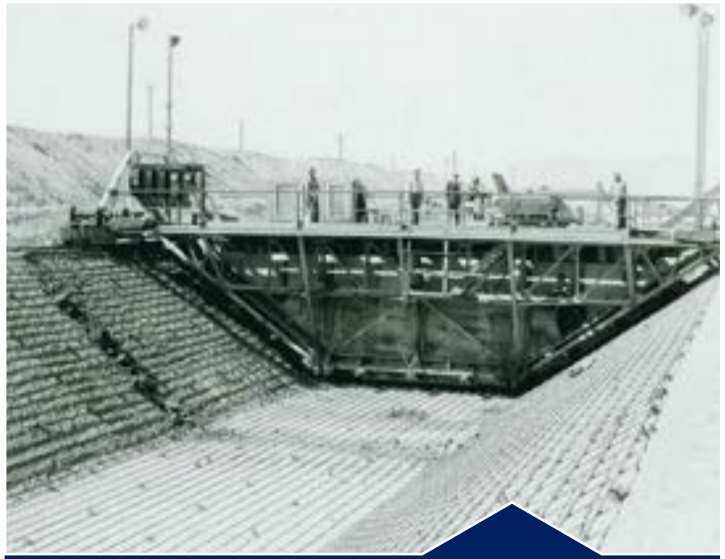


- Less snow
- More fires
- Dramatic increases in flooding
- Dry years likely get drier

PUREWATER SOUTHERN CALIFORNIA

Metropolitan Overview

Developing Water Supplies for the Region



1930s:

Colorado River Aqueduct



1960s:

State Water Project



1990s:

Local Supply & Conservation

PUREWATER SOUTHERN CALIFORNIA



https://youtu.be/evHCEcChKyg?si=DG_HD6uSDX527cx6

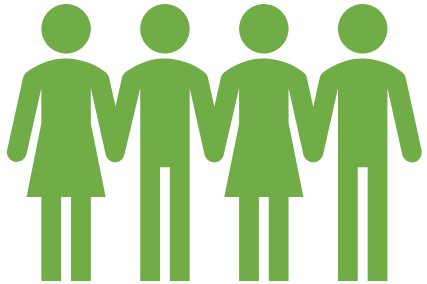
Pure Water Southern California

In numbers



Up to 150 million gallons per day

(Nearly 600 liters)



Enough water for over 1.5 million people



One of the largest programs of its kind in world

PUREWATER SOUTHERN CALIFORNIA

Pure Water Southern California Program

How it works



① **Water is used**

in homes, businesses, and industries in LA County



② **Water is cleaned**

at Sanitation Districts' A.K. Warren Water Resource Facility



③ **Water is purified**

at Metropolitan's advanced water purification facility



④ **Water is conveyed**

through 40+ miles of pipelines to groundwater basins or into Metropolitan's drinking water system

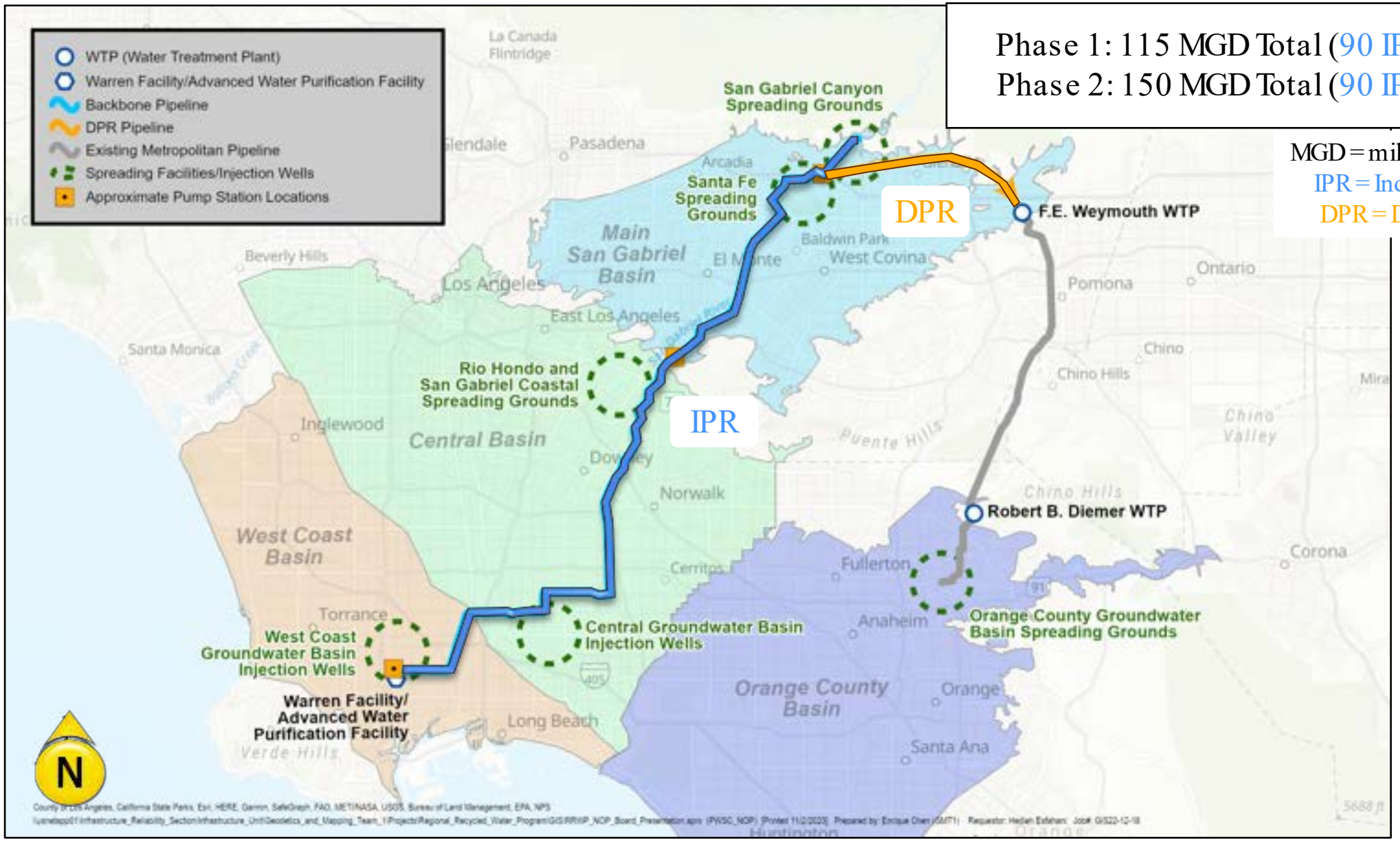


⑤ **Pure Water becomes**

a new climate-resilient source of water for Southern California

PURE WATER SOUTHERN CALIFORNIA

Program Overview (Phase 1 and 2)

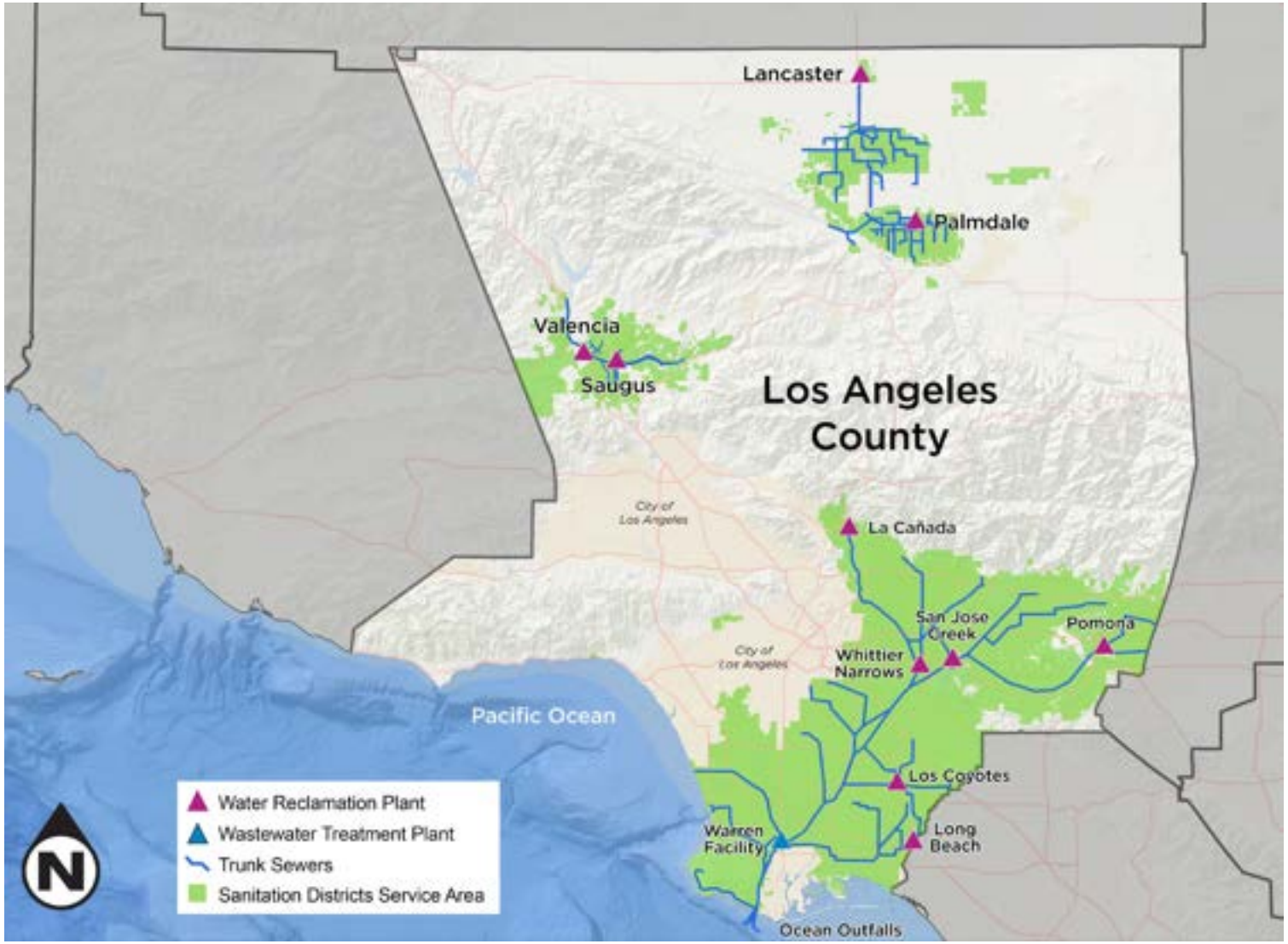


Phase 1: 115 MGD Total (90 IPR + 25 DPR)
Phase 2: 150 MGD Total (90 IPR + 60 DPR)

MGD = million gallons per day
IPR = Indirect potable reuse
DPR = Direct potable reuse

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Los Angeles County Sanitation Districts



Collect and treat sewage from ~5.5 million people

GOVERNANCE

24 special districts with one administrative staff

SERVICE AREA

78 cities & unincorporated county
824 square miles

INFRASTRUCTURE

1,400 miles of sewers
11 wastewater treatment plants
Ocean outfall system

PUREWATER SOUTHERN CALIFORNIA

A.K. Warren Water Resource Facility

LOS ANGELES COUNTY SANITATION DISTRICTS
Converting Waste Into Resources



Treats an average flow of >250 MGD

Currently, cleaned water flows to the ocean

LACSD's largest untapped source of treated wastewater

PUREWATER SOUTHERN CALIFORNIA

A.K. Warren Water Resource Facility

LOS ANGELES COUNTY SANITATION DISTRICTS
Converting Waste Into Resources



Processes biosolids and food waste into compost

Produces and runs on its own green energy

PUREWATER SOUTHERN CALIFORNIA

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Program Partners

LOS ANGELES COUNTY SANITATION DISTRICTS
Converting Waste Into Resources

Metropolitan Member Agencies

UPPER WATER
UPPER SAN GABRIEL VALLEY MUNICIPAL WATER DISTRICT

Central Basin Municipal Water District

WEST BASIN MUNICIPAL WATER DISTRICT

CITY OF LONG BEACH INCORPORATED 1897

A BALANCED CITY • INDUSTRIAL • RESIDENTIAL • COMMERCIAL
TORRANCE

3V

LA DWP

Groundwater Basin Managers

WRD
WATER REPLENISHMENT DISTRICT

MainSanGabrielBasin WATERMASTER

Colorado River Partners

SOUTHERN NEVADA WATER AUTHORITY

ARIZONA DEPARTMENT OF WATER RESOURCES

CAP
CENTRAL ARIZONA PROJECT

Other Key Partners

SAN GABRIEL VALLEY MUNICIPAL WATER DISTRICT

US Army Corps of Engineers®

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead℠

Public Works
LOS ANGELES COUNTY

PUREWATER SOUTHERN CALIFORNIA

Considering Affordability:

Securing Outside Funding & Partner Contributions for $9.4B project



<u>Secured:</u>

- $80M State Funding
- $16.5M Partner contributions received to date
- $125M USBR Large-Scale Water Recycled Grant
- $5M USBR Planning Grant
- $1M Pilot Project State Grant
- $750K USBR Water Recycling Research Grant

<u>Upcoming Opportunities:</u>

- State climate bond
- Additional partnership contributions

Program Benefits

Water Supply Benefits

- Provides a Sustainable Supply of Water
- Increases Water Resiliency
- Replenishes Groundwater Basins
- Creates a Local Supply of Water

Environmental Benefits

- Enhances Water Quality
- Reuses the Largest Untapped Source of Wastewater in the Region
- Reduces Reliance on Imported Supplies

Economic Benefits

- Fuels Economic Growth
- Generates Jobs

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Workforce Development

Internship with Carson High School

Project Labor Agreement

- Fair wages
- 60% local-hire goal
- 15% transitional- worker goal

Workforce Training Center

- Pathway to local jobs
- Water/wastewater industry skills development
- Job readiness

Workforce Development Pilot

- K-12 education & outreach
- Industry Awareness
- Hands on training (Internship Opportunities)

The program is projected to support up to **75,000** jobs during construction and **2,460** ongoing jobs once operational

Program Outreach:

Sharing Information with Communities



Tours



Presentations



Events



Community Partnerships



Web



Social Media



News



Multilingual Materials

Program Schedule

2021-2026

Environmental Planning

√ Completed
CEQA Certified (Feb. 2026)

2023-2040

Design and Construction

2033-2040

Phase 1 Startup and Operations

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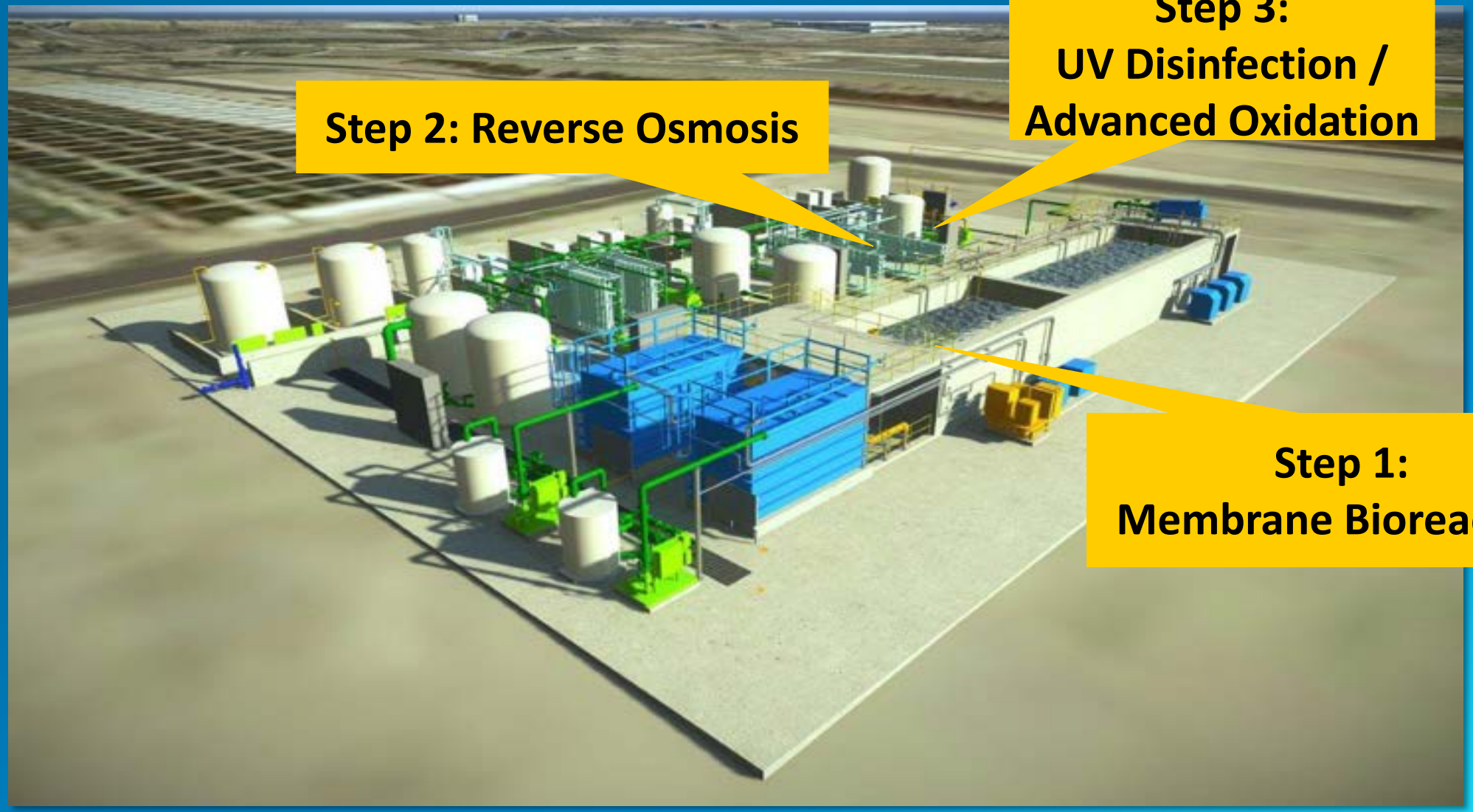


Grace F. Napolitano Pure Water Southern California Innovation Center

- Provides costs and data for full-scale facility
- Critical for gaining public support
- Tests an innovative purification process (and planning for DPR)
- Helps obtain regulatory approval of process

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Purification Process



Let’s Take a Tour



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Wrap-up and Questions

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Question #1

- Name the first of the three steps in the purification process.

Question #2

- Name the second step in the purification process.

Question #3

- Name the final step in the purification process.

Question #4

- How many million gallons of water will the **full-scale** program produce daily?

Question #5

- In what year is the program expected to be online?

PUREWATER SOUTHERN CALIFORNIA

Metropolitan Pure Water Website

www.mwdh2o.com/purewater



Post-Tour Survey

MWD Workforce Development
"See Yourself in Water" Job App

Instructions:

1. Scan QR code
2. Send text “workforce”
3. Tap link to access

Contact Information

Lead Name
Position
email@mwdh2o.com

Support Name
Position
email@mwdh2o.com

Newsletter Sign-Up

Post-Tour Survey

Website: mwdh2o.com/purewater
Socials: @mwdh2o

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

LOS ANGELES COUNTY SANITATION DISTRICTS
Converting Waste Into Resources

PUREWATER SOUTHERN CALIFORNIA

Contact Information

Lead Name
Position
email@mwdh2o.com

Support Name
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Newsletter Sign-Up

Careers in Water App

1. Send text "workforce"
2. Tap link to access

Website: mwdh2o.com/purewater

Socials: @mwdh2o

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

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Climate Adaptation Master Plan for Water

CAMP4W
Climate Adaptation
Master Plan for Water

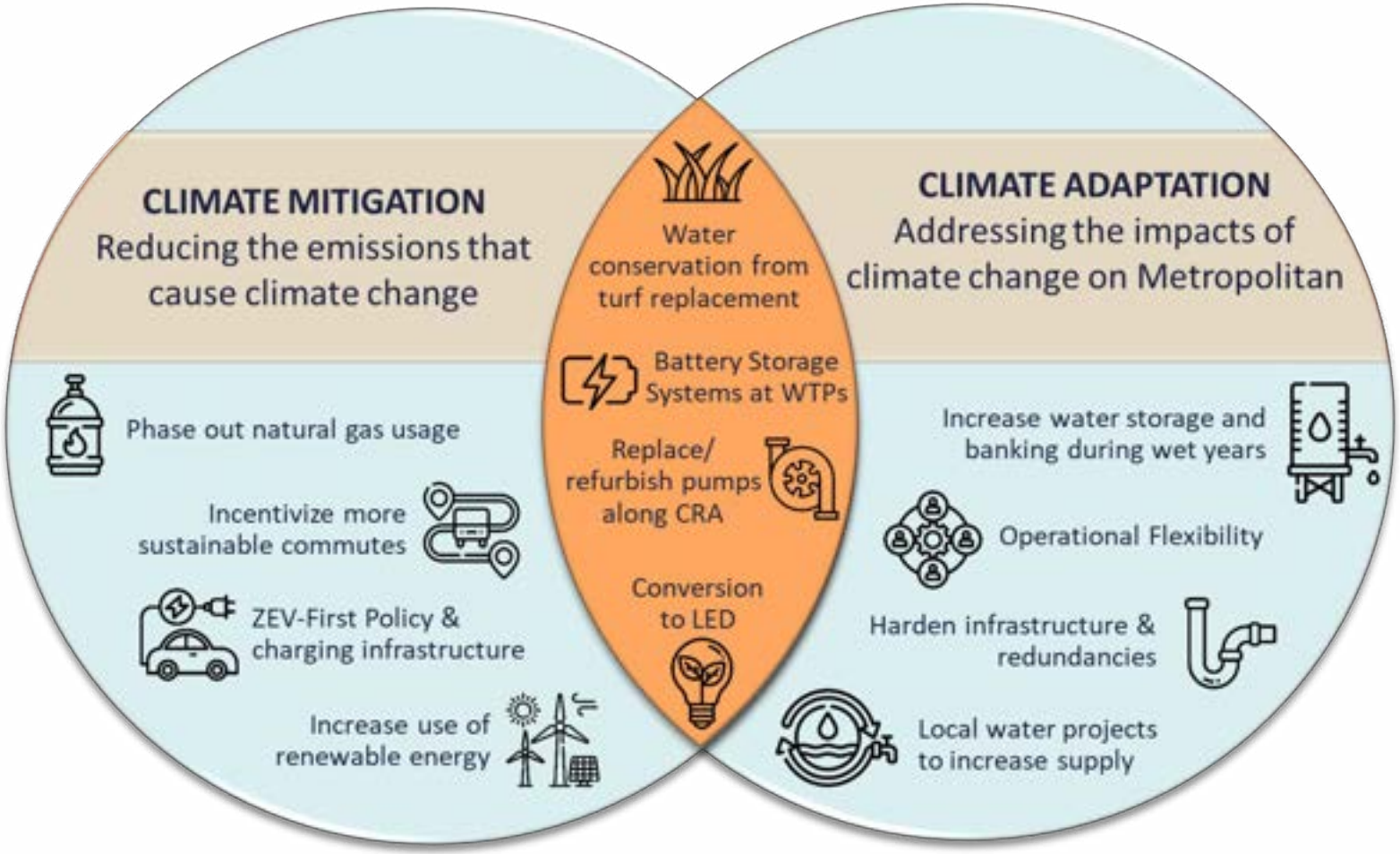
A comprehensive roadmap to guide our future capital investments and business model.



CAMP4W

Climate Adaptation Master Plan for Water

- Integrates climate and water resource planning with financial plans
- CAMP4W strengthens resilience and reliability of Metropolitan and Member Agencies
- "Stronger Together" focus on reliability, resilience, financial sustainability, affordability and equity



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Colorado River

- Backbone of Southern California's imported water supply for 80+ years
- Has 40 million people depending on its water (across 7 states and Mexico)
- Sustains people, farms, tribal nations, and wildlife; irrigates 5 million acres of land

Long-Term Challenges

- *Over-allocation and climate change have reduced reservoir storage to near critical levels*
- *Basin States need to reduce demands to keep River supplies sustainable*



Photo credits: NASA





Water Education Colorado

State Water Project

- Metropolitan has a long-term water supply contract with the CA Department of Water Resources for up to 1.9 million acre-feet of water annually, depending on water supply conditions in Northern CA
- DWR determines the allocation based on available water storage, projected water supply, and water demands
- Allocations are updated monthly until a final allocation is determined in May or June

Future Opportunities

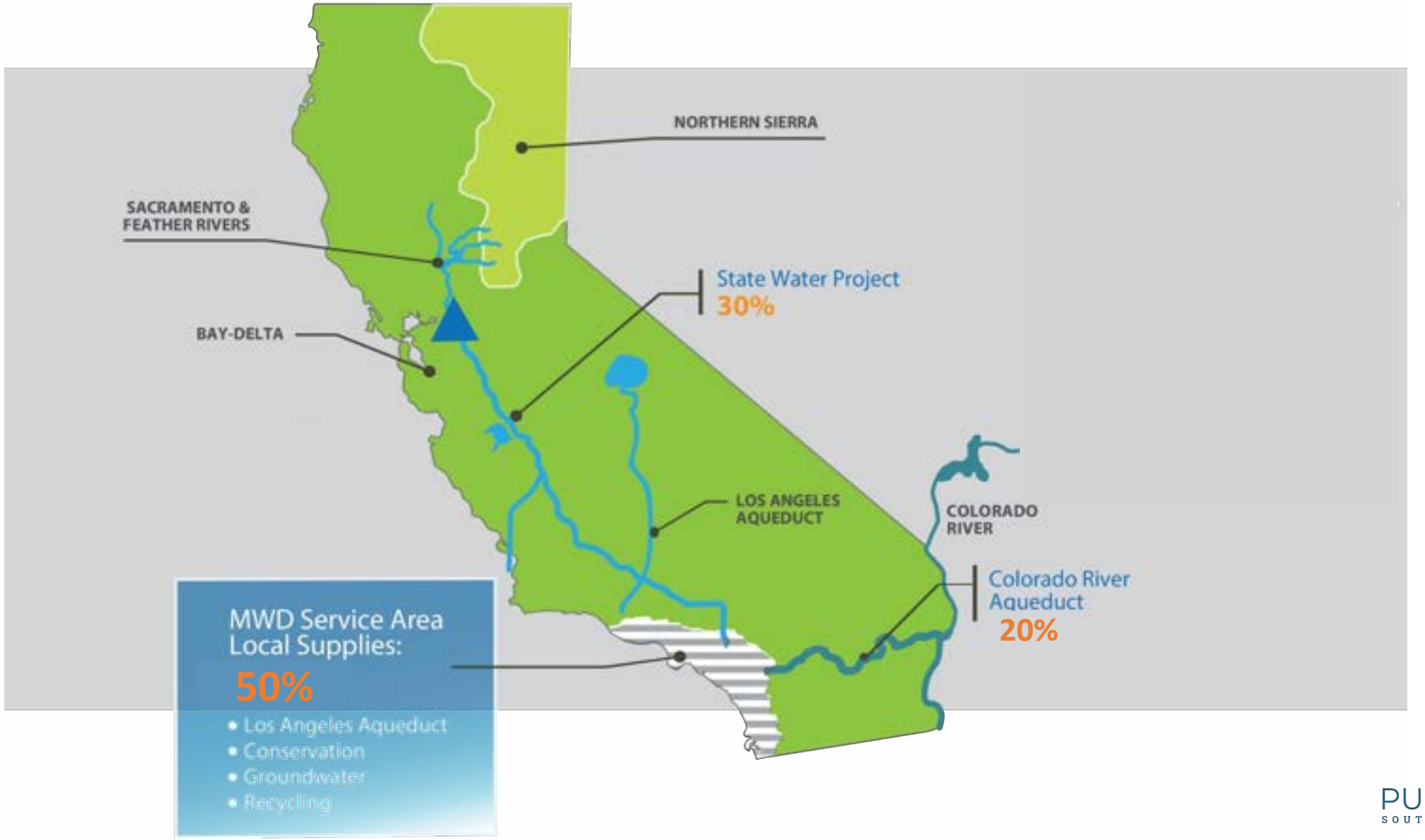
- *Increase reliability in the SWP delivery system*
- *Increase storage opportunities to better capture water in wet or surplus years*



SWP System, Photo courtesy CA DWR

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Where does Southern California get its water?



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Pure Water Southern California Program

How it works



① **Water is used** in homes, businesses, and industries in LA County



② **Water is cleaned** at Sanitation Districts' A.K. Warren Water Resource Facility



③ **Water is purified** at Metropolitan's advanced water purification facility



④ **Water is conveyed** through 40+ miles of pipelines to groundwater basins or into Metropolitan's drinking water system

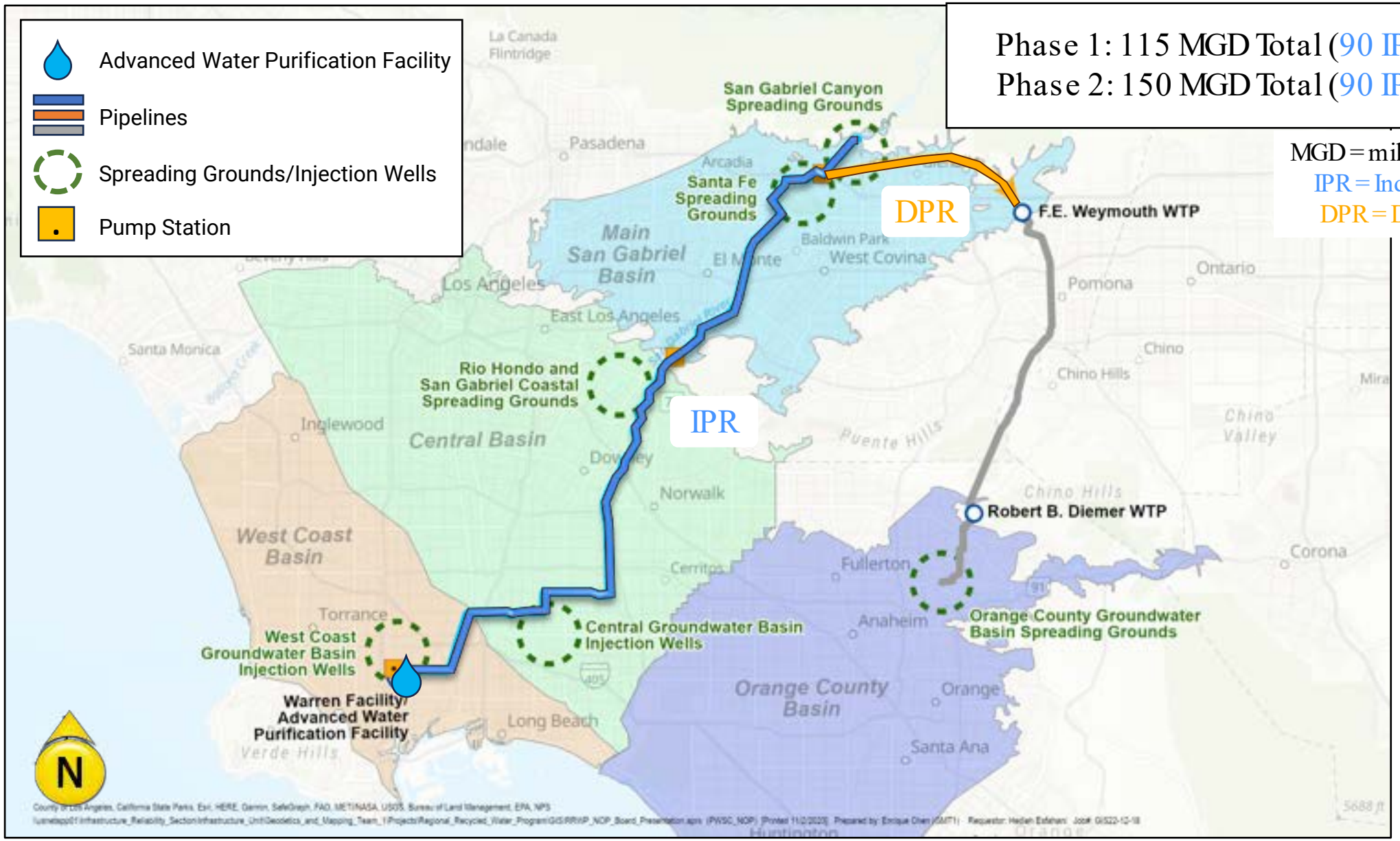


⑤ **Pure Water becomes** a new climate-resilient source of water for Southern California

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Where is this water going to go?



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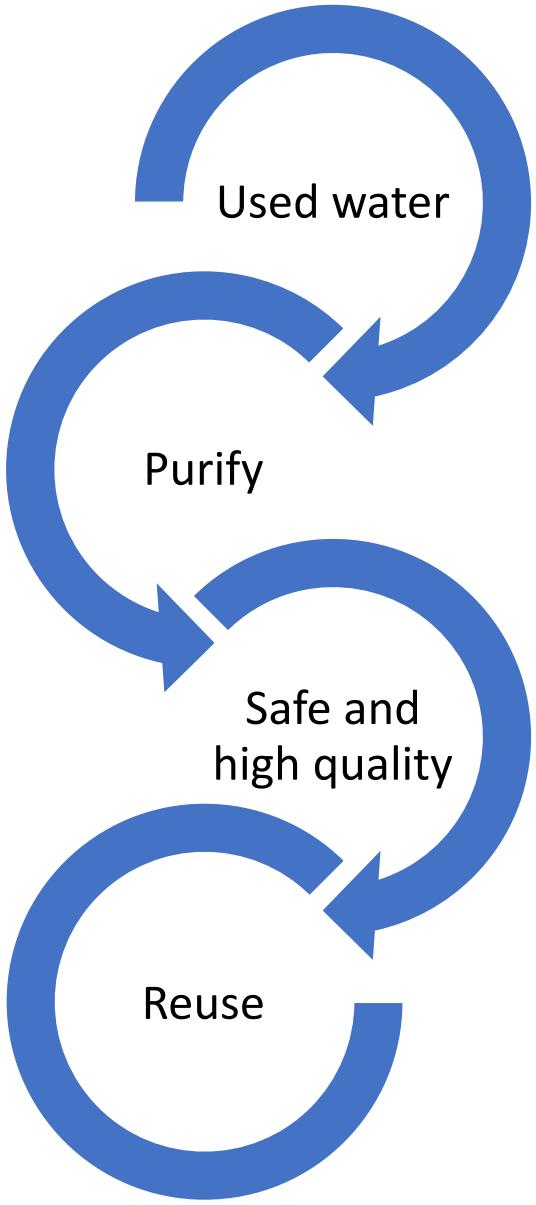


Grace F. Napolitano Pure Water Southern California Innovation Center

A demonstration facility to help us prepare for the full facility, testing:

- Cost
- Treatment steps
- Water quality
- Public support
- Regulations

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What is recycled water?

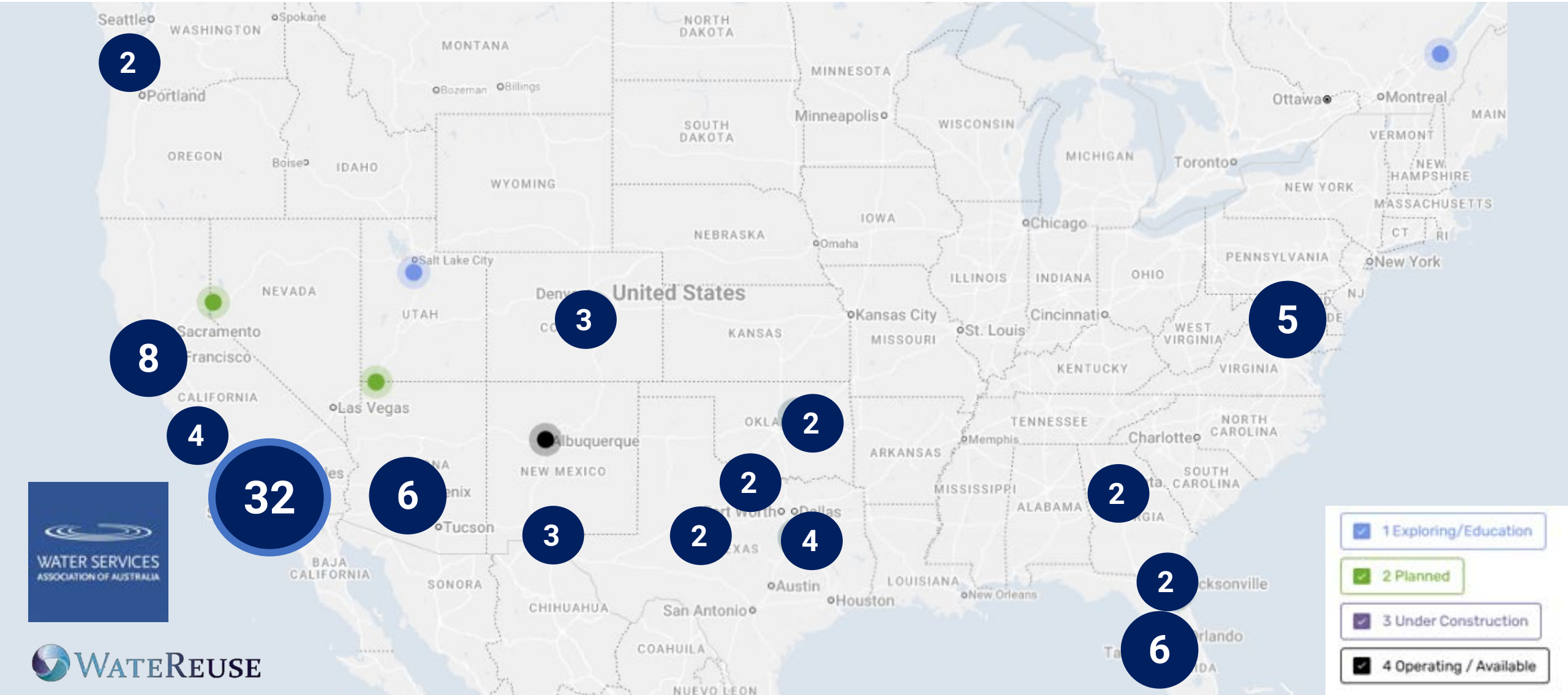
Used water that is purified and may be used again for multiple uses, from irrigation to drinking.

Other places that use recycled water:

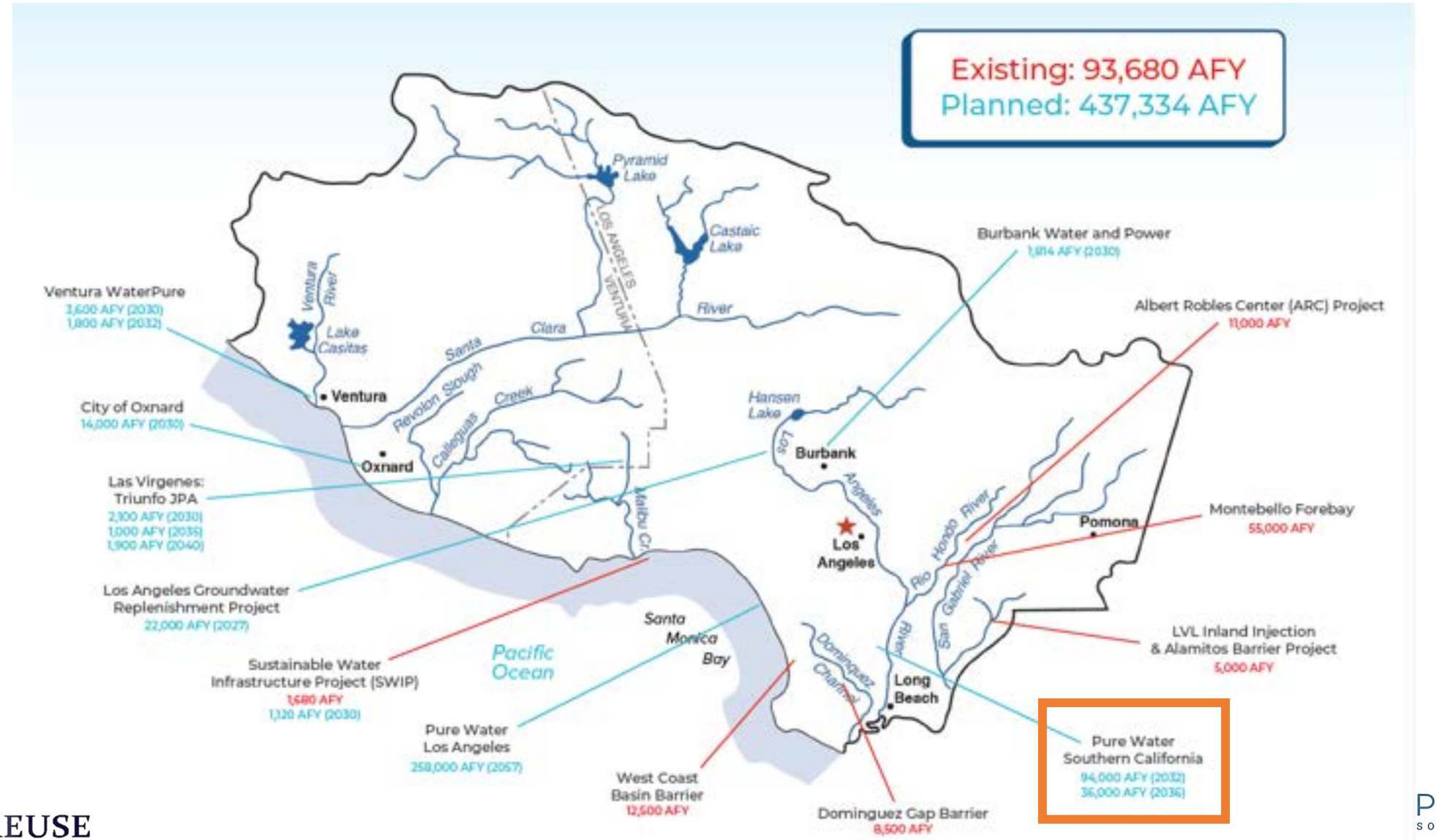
- *Orange County*
- *San Diego*
- *Monterey*
- *Singapore*
- *Australia*
- *Disneyland*

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How common are recycled water projects across the U.S.?



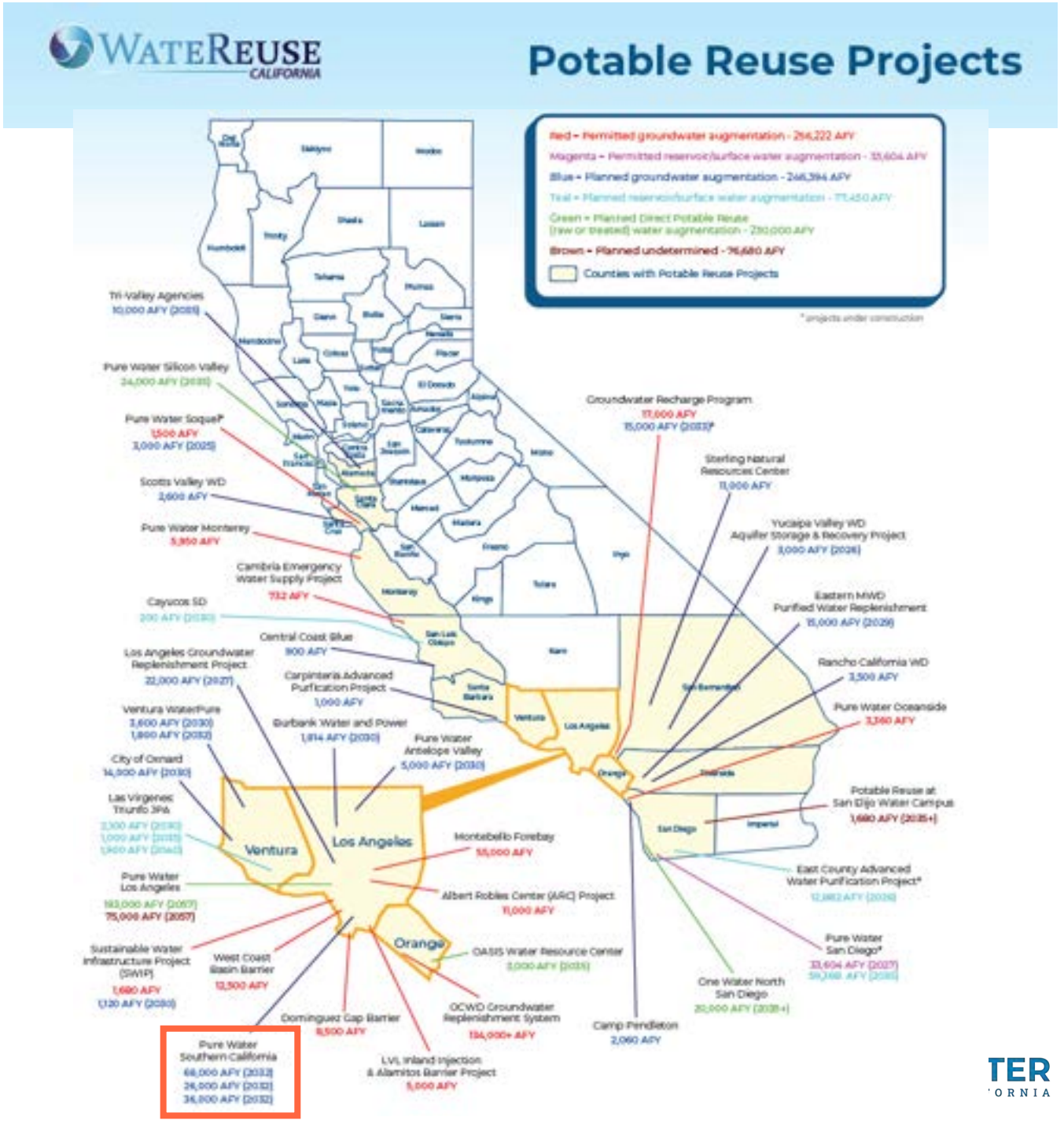
How common are recycled water projects across LA County?



WateReuse

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How common are recycled water projects across California?



What is a Spreading Ground?



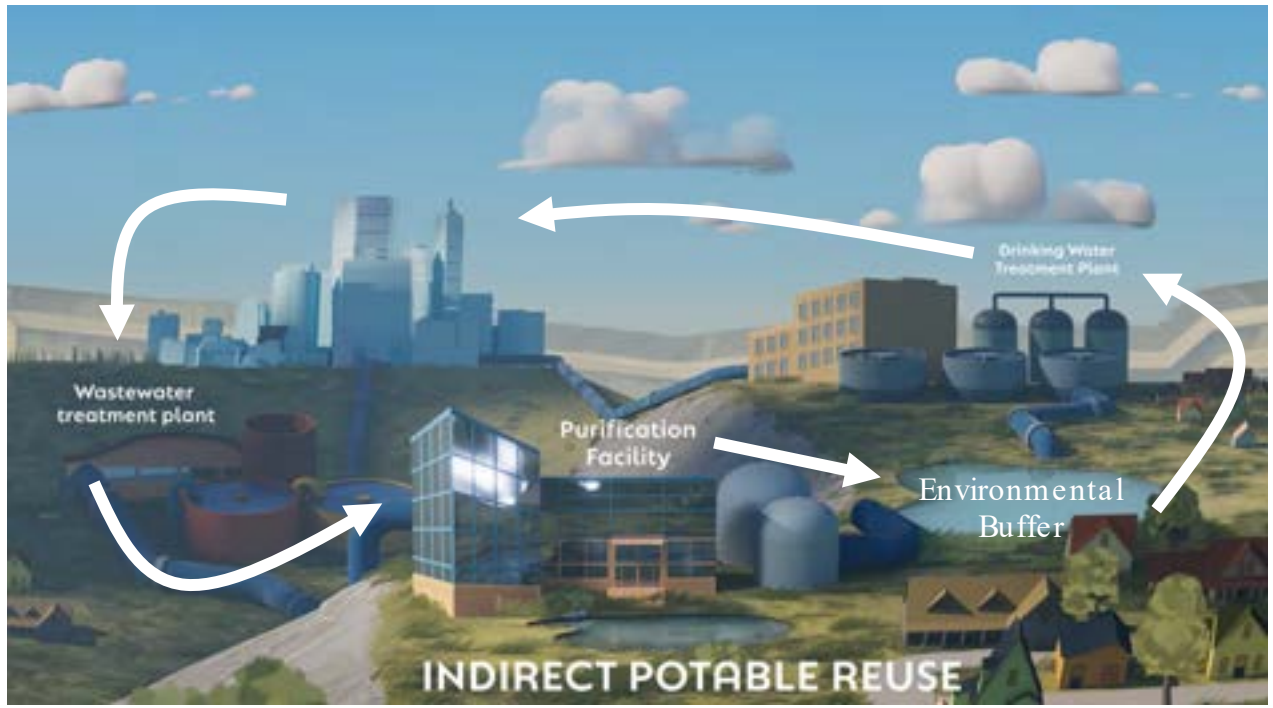
San Gabriel Coastal Basin Spreading Grounds

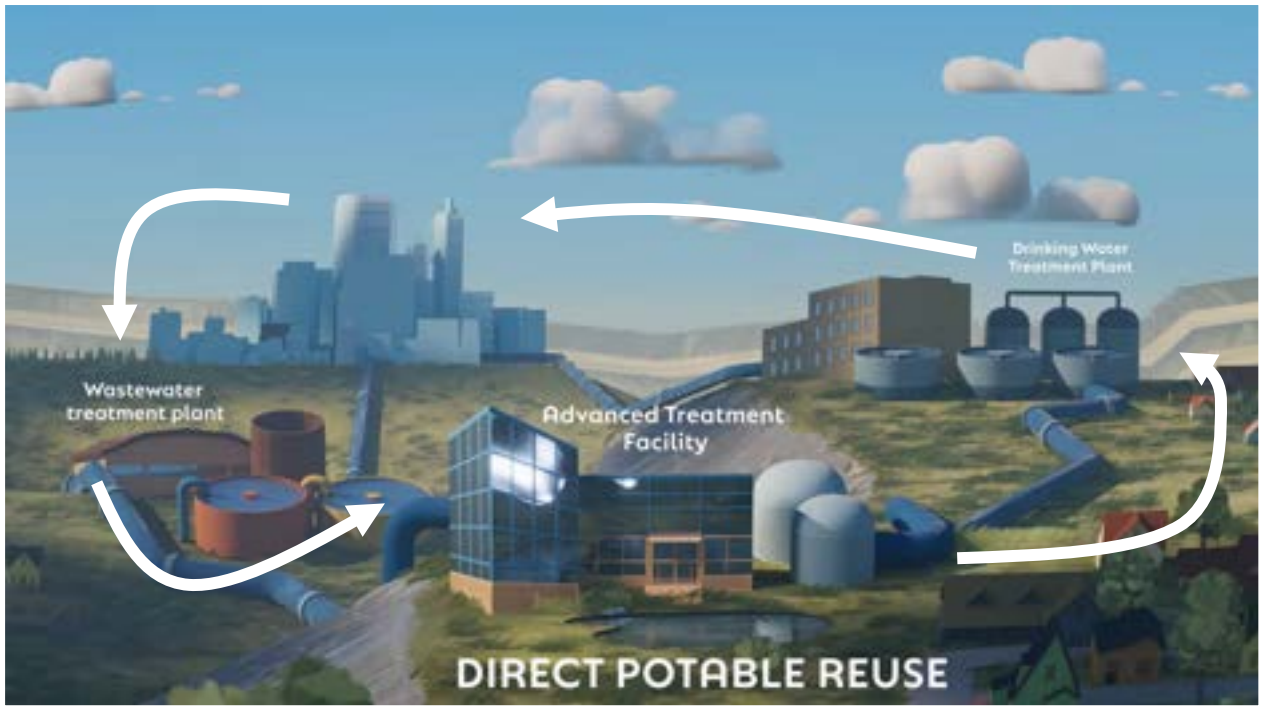


Rio Hondo Spreading Grounds

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Indirect Potable Reuse vs. Direct Potable Reuse





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Program Cost Estimate – Phase 1

Description	Estimate
Water Produced	115 million gallons daily
Capital Program Cost[1]	$9.4 billion
Annual Operations & Maintenance Costs	$194 million/year[2]
Unit Cost of Water	$2,800 — $5,400/acre-foot[3]

1. *The cost estimates use maturity-specific contingencies and is estimated in 2025 dollars.*
2. ***Significant O&M costs start with facilities commissioning as early as 08/2035 & likely starting in 2037***
3. *An acre-foot of water is about 326,000 gallons and enough to serve three households in Southern California annually.*

NOTE: Estimates will be further evaluated and refined as work matures.

Program Estimated Electricity Consumption

Phase	Electricity Use (kWh/AF)
Advanced Water Purification Only	2,053
Advanced Water Purification + Conveyance	3,422

kWh = kilowatt hours, AF = acre-feet

Topic – Dark Theme

- First idea
- Second idea
- Third idea

Topic & Photos

Sub-header







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Topic – Gradient Logo

- Idea 1
- Idea 2
- Idea 3

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THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

LOS ANGELES COUNTY SANITATION DISTRICTS

Converting Waste Into Resources

Design Resource:

Logos







Design Resource:

Icons



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Question #1

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- How many million gallons of water will the **full-scale** program produce daily?

PUREWATER SOUTHERN CALIFORNIA

Question #5

- In what year is the program expected to be online?

An Overview of Operational Data Reporting Strategies and Visualization using PowerBI

James C. Vickers, PE
National Specialty Leader - Membranes

Brown AND Caldwell



Introduction

Jim Vickers

- National Specialty Leader – Membranes
- Involved with MF and RO since 1988
- Primary Author – USEPA Membrane Filtration Guidance Manual
- Primary Author – AWWA MF/UF Manual of Practice M53
- WRF 13-03, 13-13, (Critical Control Points) and WRF-4958 Conductivity Profiling.

Item of Interest

- Former President of Separation Processes, Inc. (SPI)
- MF/RO Operational Support Specialist

Noteworthy Project Experience

- OCWD since 1992
- West Basin Since 2000
- East County Municipal Water District (Padre Dam)
- San Patricio Municipal Water District
- Yucaipa Valley Water District
- Monterey One Water



Brown AND Caldwell

Operational Monitoring Staff

Brown and Caldwell

- Gabi Downey
- Jan Guenther
- Kyle Peebles

Selected Monitoring Locations

- OCWD – Since 1980
- West Basin Municipal Water District – Since 1998
- Yucaipa Valley Water District – Since 2007
- Water Replenishment District
- Sweetwater Authority
- Encina
- Monterey One Water



Dashboards from 2015

Topics for Discussion

- Membrane Data Management: History & Current Practices
- Data Visualization Implementation
- Membrane Cleaning and Cleaning Predictions
- Newly Developed Visualization Concepts



Membrane Data Management: History & Current Practices

RO Performance Monitoring – Big Picture

- Operators focus on two main questions:
  - Are the membranes fouled/scaled? (Indicates cleaning)
  - Is the product water quality acceptable? (Indicates replacement)
- To answer those questions, three “Normalization” parameters have been historically used
  - A measure of membrane permeability or productivity (flow)
  - A measure of feed side pressure differential increase (pressure)
  - A measure of membrane rejection (percent removal)
- In terms of "AI" normalization equations used for the past 50 years are the underlying "model" by which all systems operate!
- Data Management is a continuation and reinforcement of operator training principals that is used daily!



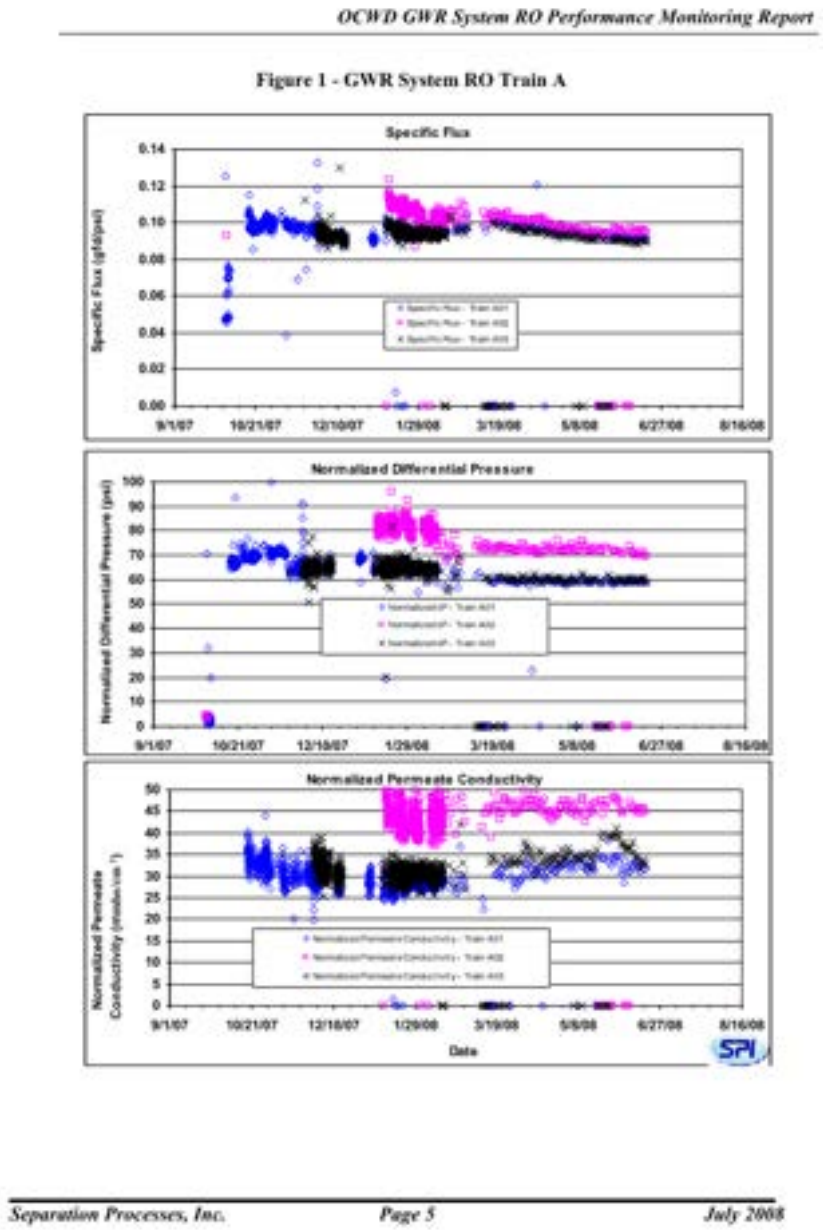
First Spiral Wound Reverse Osmosis Module *General Atomic (San Diego, CA) circa 1964*

Data Management Basics

- Data Management is a key component of facility operation.
- Traditional data is stored on a historian or data logger.
- The Typical HMI Platform has very poor data trending visuals.
- Our ability to generate data far exceeds our ability to review/analyze.
- Information is more easily understood when visuals replace numbers.
  - The mind creates a visual from numbers on a page.
- Traditional methods to extract data involve the generation of a report and subsequent manipulation of data in a spreadsheet.
- Reports may have spreadsheet visuals (charts) limited by Excel.
- RO membrane manufacturer normalization software requires manipulation and does not link to the database.

Observations

- Historic Data Management is inherently an exercise in re-visiting the past.
- Operating reports typically prepared either monthly or quarterly.



2008 Report Format

Data Visualization Implementation

Benefits of PowerBI: From Data Collection to Data Driven Decision Making

- Power BI can replace traditional SCADA reports.
- Cloud Based interface that can be updated automatically daily.
- Goal: Make available to all (operators and management) the same information that would be needed by a specialist to make a decision.
- Visualization Platforms are far more powerful than commercial data display platforms such as Hach WIMS because of
  - Ability to create custom visuals.
  - Ability to update the information daily.
  - Ability to manipulate the data across any date range.
  - Ability to manipulate data using Python Programming Language.
  - Ability to “Array” data across multiple units using AI assistants such as “Claude”.
  - Prediction tools have arrived!
- BC has been working with the interface for a number of years and continue to develop and expand the content
- We have developed additional tools to focus on operational activities such as water quality, cleaning and integrity monitoring.
- A properly implemented data management approach is an “optimization strategy” that will pay for itself many times over.



Membrane Dashboards



Plant Overview Pages

- Flows
- MF/UF Water Quality
- RO/ NF Water Quality
- Removal Performance
- Pretreatment

MF/UF Pages

- Plant Overview
- Membrane Installations
- Unit Performance
- PDT / CIP
- MF Turbidity

RO/ NF Pages

- Key Performance Indicators
- System Health Chart
- CIP Prediction Dashboard
- Membrane Installations
- Membrane CIP's
- Membrane EC Profiles
- EC Profile Dashboard / Raw Data / Ratio
- Feed and Permeate
- Unit Overviews
- Specific Flux
- delta P / Normalized delta P
- % Removal / Normalized % Removal
- CIP Prediction Chart
- Power Consumption / ERD-IBP Power
- Unit Health by Stage
- Unit Power Consumption / ERD-IBP Power

Expand From Membranes To Plant-Wide Monitoring



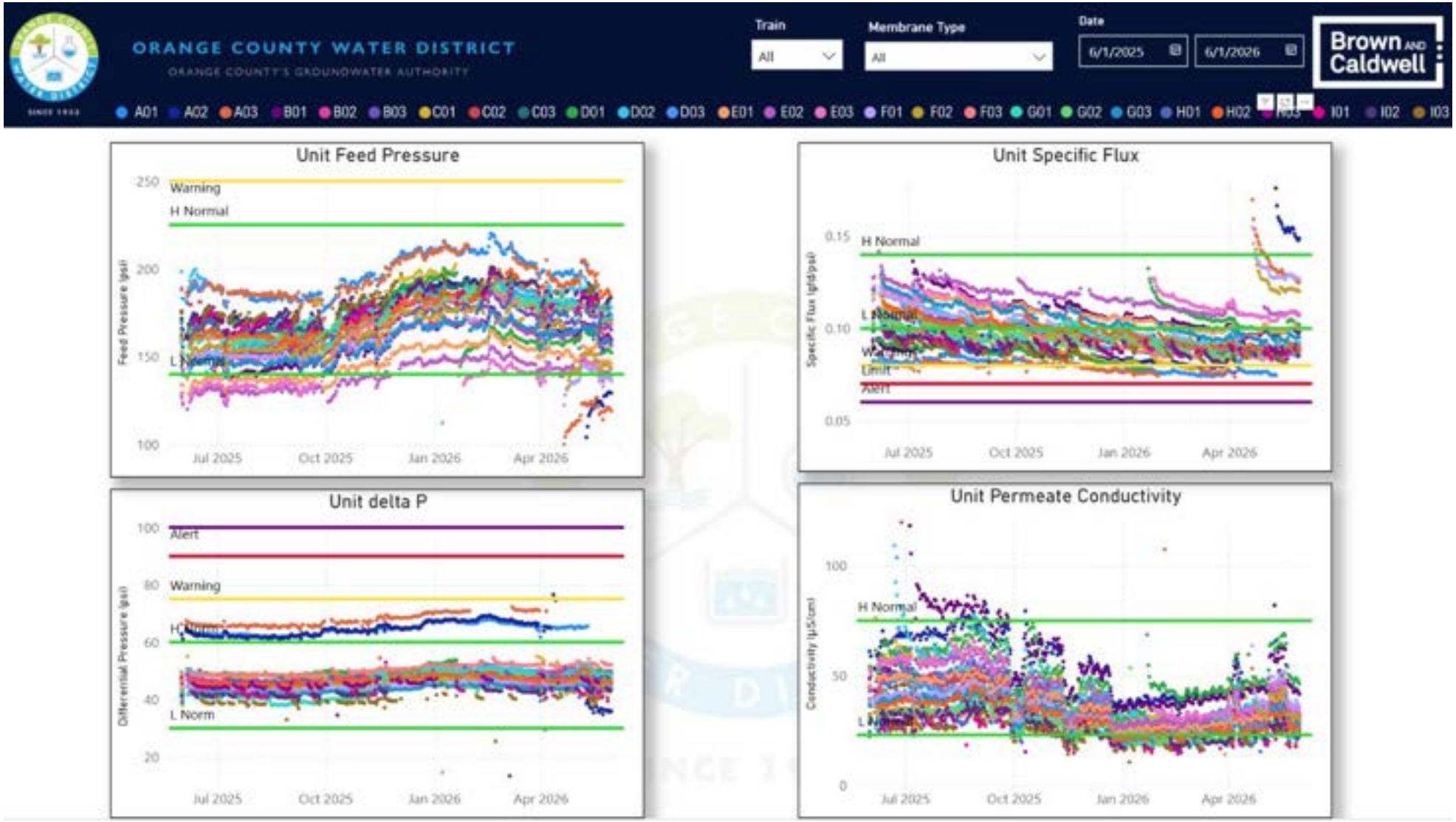
New Process Areas

- Plant Influent and Pretreatment
- Post-treatment
- Disinfection (UVAOP)
- Chemical monitoring
- Chemical Cost & Projections Expanded
- Alarm and Compliance
- Distribution & Blending
- Predictive Modeling Expanded
- Automated Data Pipeline

Example: RO “Heat Map Facility Overview”



Example: All the data is easily sorted



Example: Energy Consumption is Averaged



– The ability to average over any range eliminates “database queries”, “data diving”, and supplemental Excel spreadsheets

Membrane Cleaning & Cleaning Prediction

Practical Aspects of AWTP Facility Operation

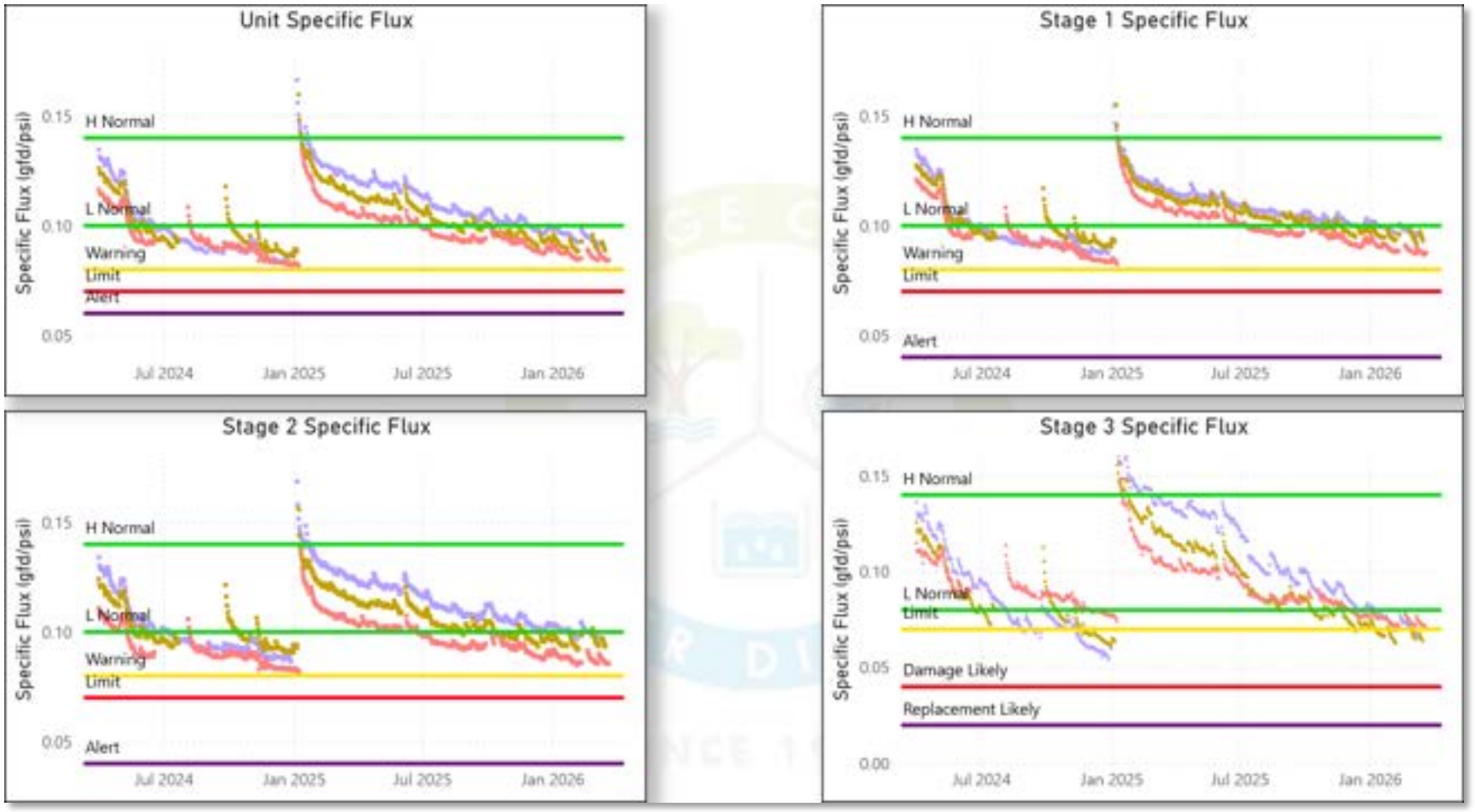
- It is not always possible to CIP when data dictates
  - Chemicals on Hand
  - CIP system issues
  - More problematic units receive priority
  - “Competition” from other areas in plant (MF, UV/AOP, Lime, construction, etc.)
- Membrane replacement is a multifaceted decision
  - Water Quality (loss of rejection)
  - TOC removal (2 log LRV compliance)
  - Energy Cost (low specific flux)





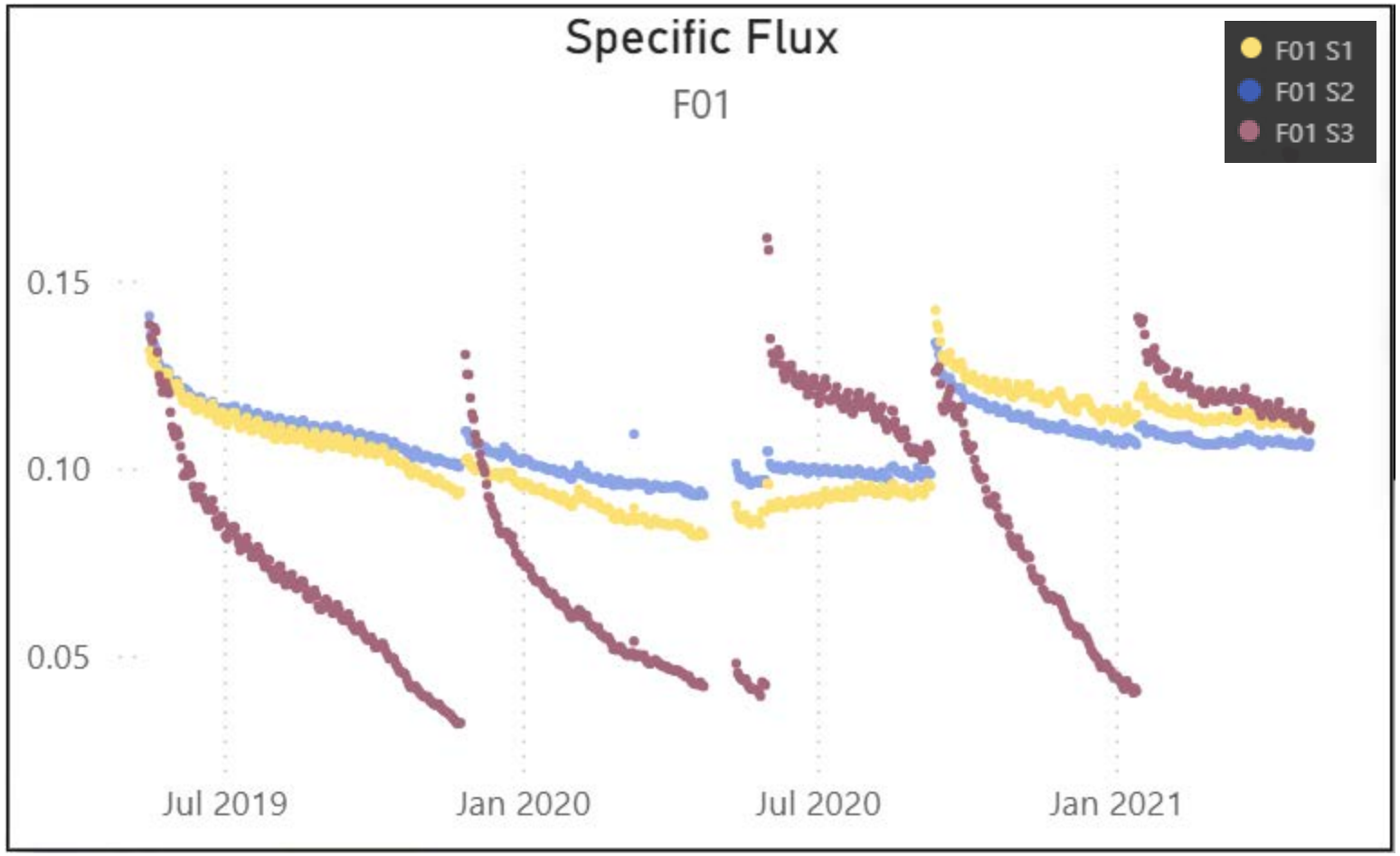
Membrane Cleaning is determined through Data Management

- Monitor specific flux as the primary trigger
  - Individual stage limits for CIP initiation
- Full unit CIP at least once per year
  - $20K - $25K per unit
- CIP Step 1 – High pH (11-12)
  - Non-Proprietary (STPP, SDDBS etc)
  - Proprietary (AWC C227, Avista A192)
- CIP Step 2 – Low pH (2.0-2.5)
  - Citric Acid



A grouping of 3 different units exhibiting similar and stable performance

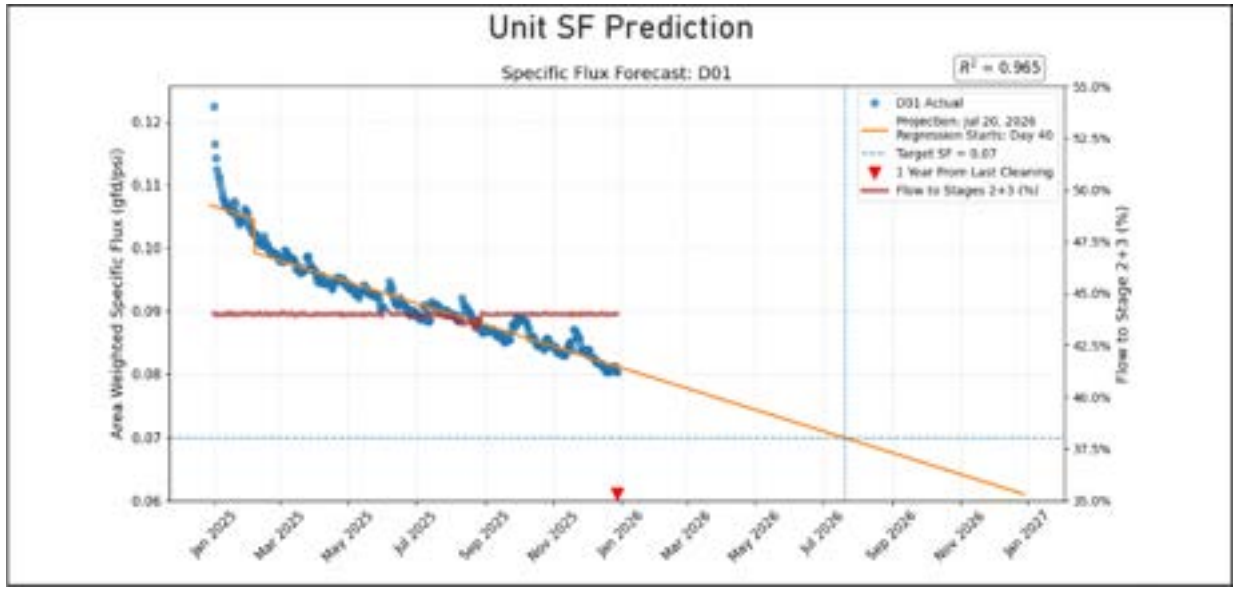
Membranes do not always foul evenly – Scaling Example



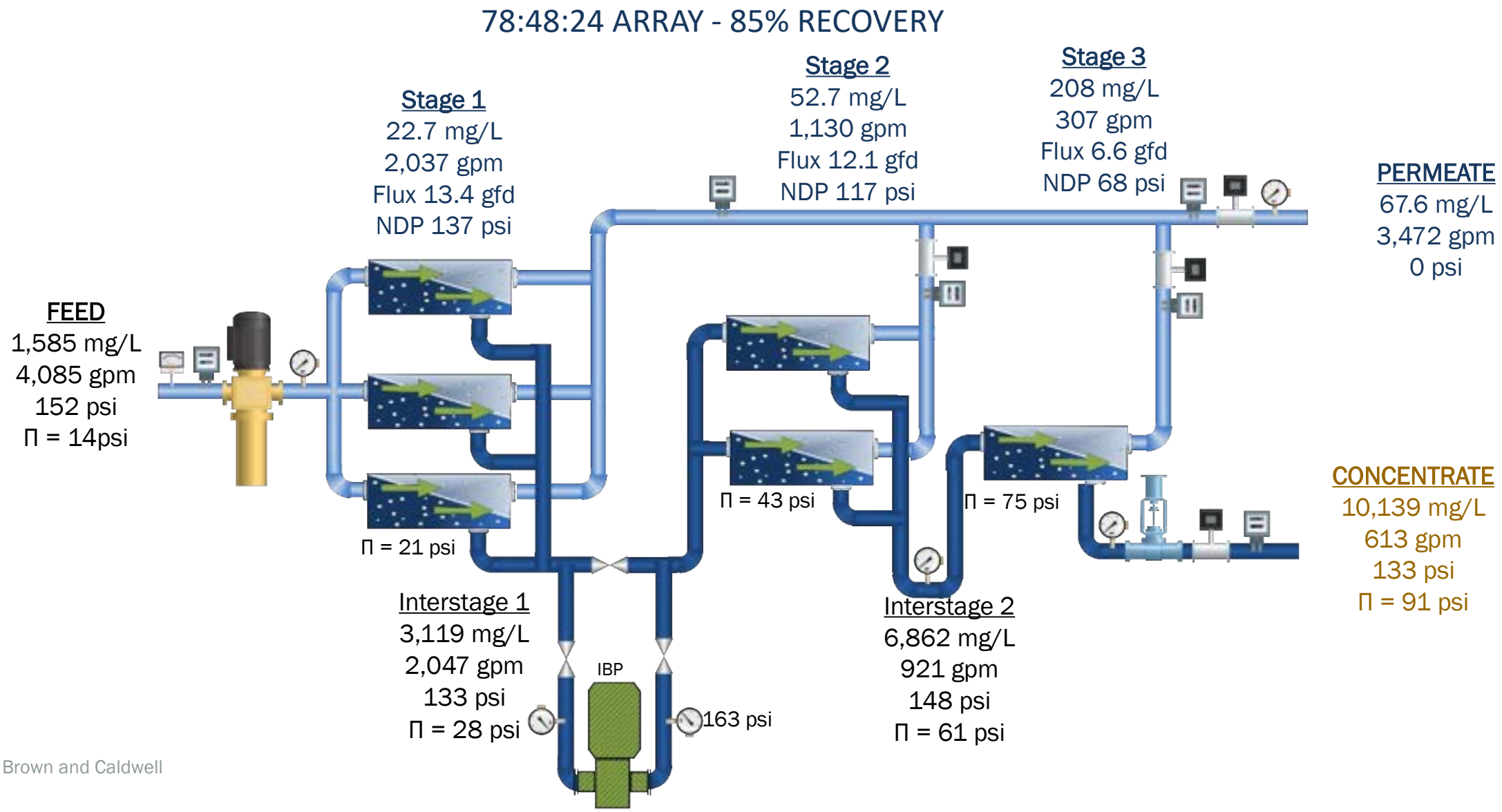
Scaling was resolved by adjustment of Antiscalant Dose (increase of 0.5 mg/L)
Cleaning Requirements were reduced resulting in a net savings to the facility

From Normalization to Prediction

- Normalization attenuates operating variability and relates performance to design conditions.
- Machine learning builds on this concept by:
  - Learning patterns in historical performance decline
  - Forecasting future behavior rather than describing past trends
- The custom model created by BC successfully:
  - Captures long-term SF decline trends
  - Forecasts when SF is expected to reach the cleaning threshold
  - Provides operators with actionable lead time for CIP planning
- Results demonstrate that performance decline can be forecasted with reasonable confidence under stable operating conditions.
- Custom models are not always available with pre-packaged data management and reporting software.

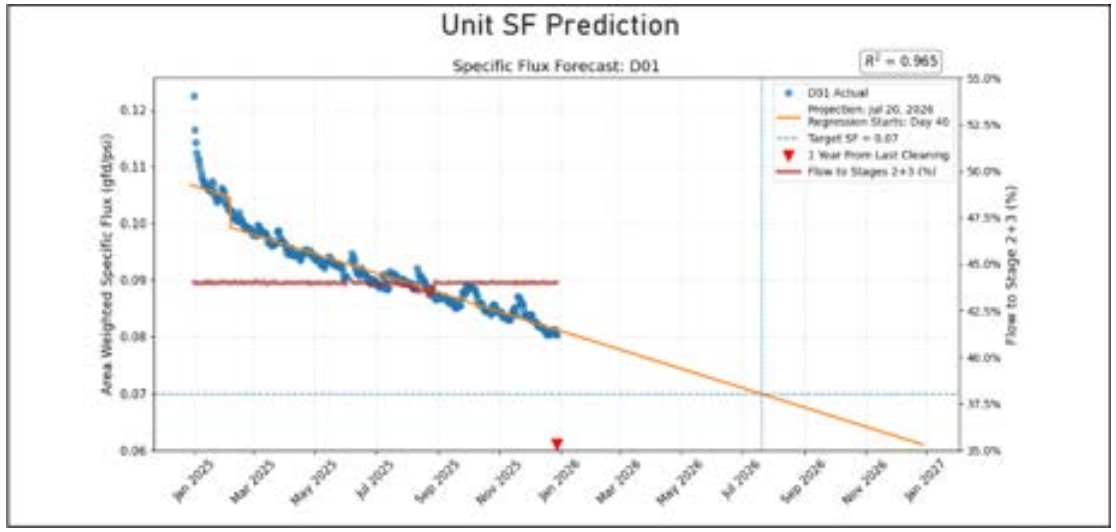


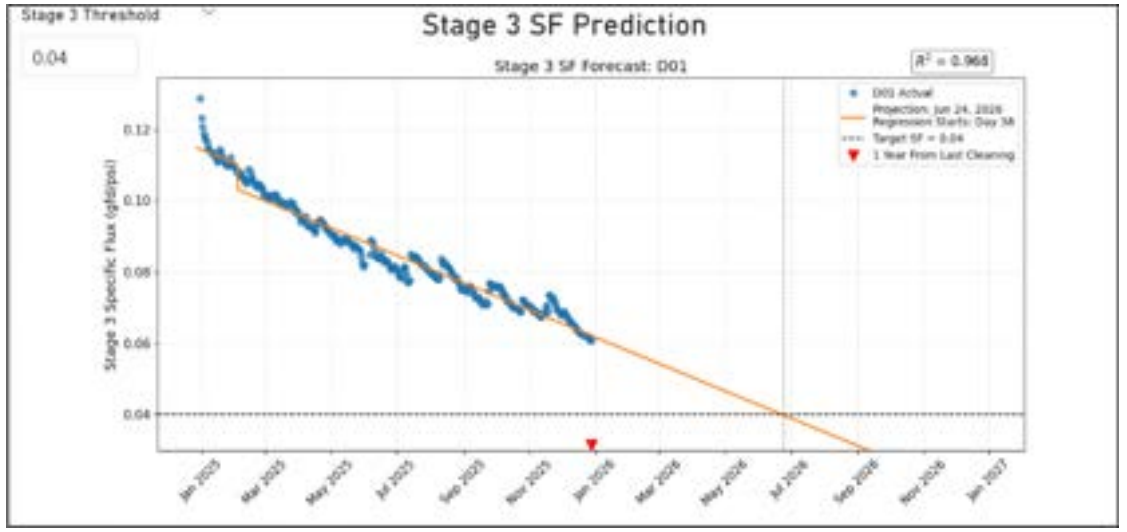
OCWD – 5 mgd RO train with Interstage boost pump

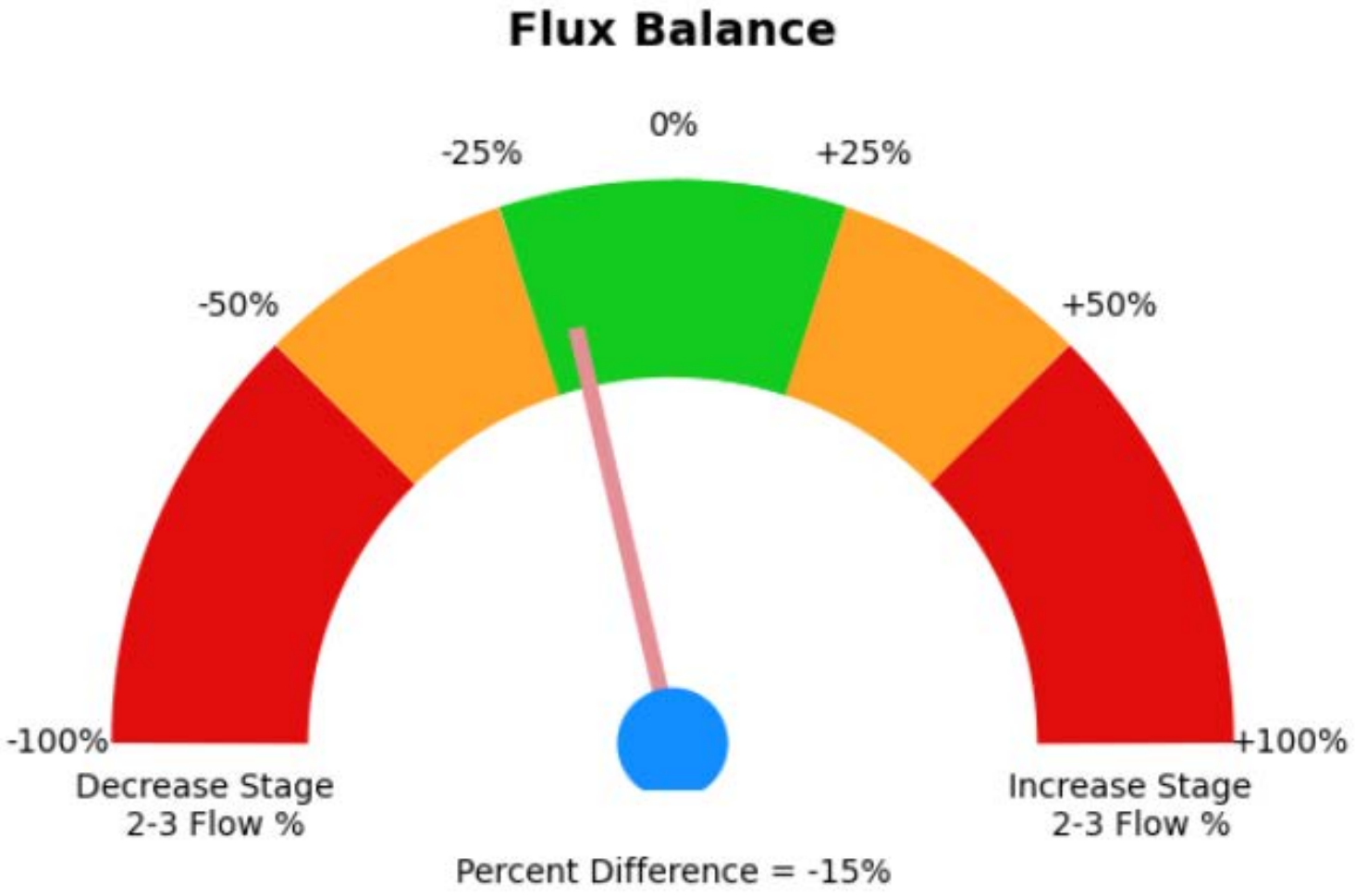


What About Stage 3?

- Applying the same methodology to Stage 3 reveals:
    - Different decline behavior compared to unit-level trends
    - Earlier or more rapid performance degradation in some cases
- This provides diagnostic insight and may inform decisions regarding partial-stage cleaning and operational optimization.
- This suggests value not just for timing CIP, but for diagnosing *where* fouling is occurring.
- Stage 3 fouling may be controlled by adjusting the interstage booster flow
    - Lowering the flow from stage 2-3 should reduce stage 3 fouling.







A novel “Flux Balance” Indicator was developed by BC to illustrate the difference in fouling rates.

This provides guidance for operators to perform a setpoint adjustment to achieve similar fouling.

Each unit now has a visual that can be displayed to indicate when cleaning will be required

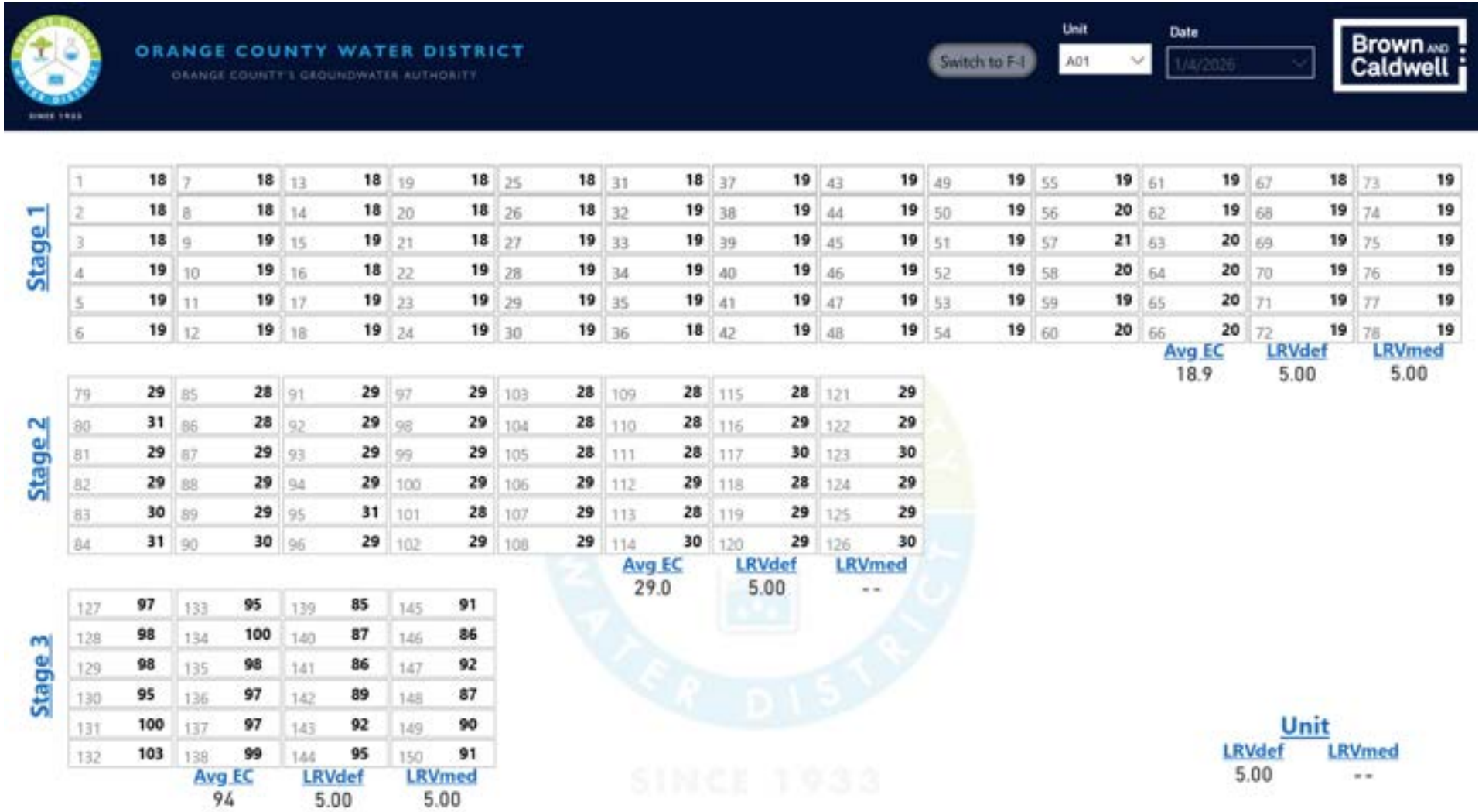


A Facility Wide View of CIP Status

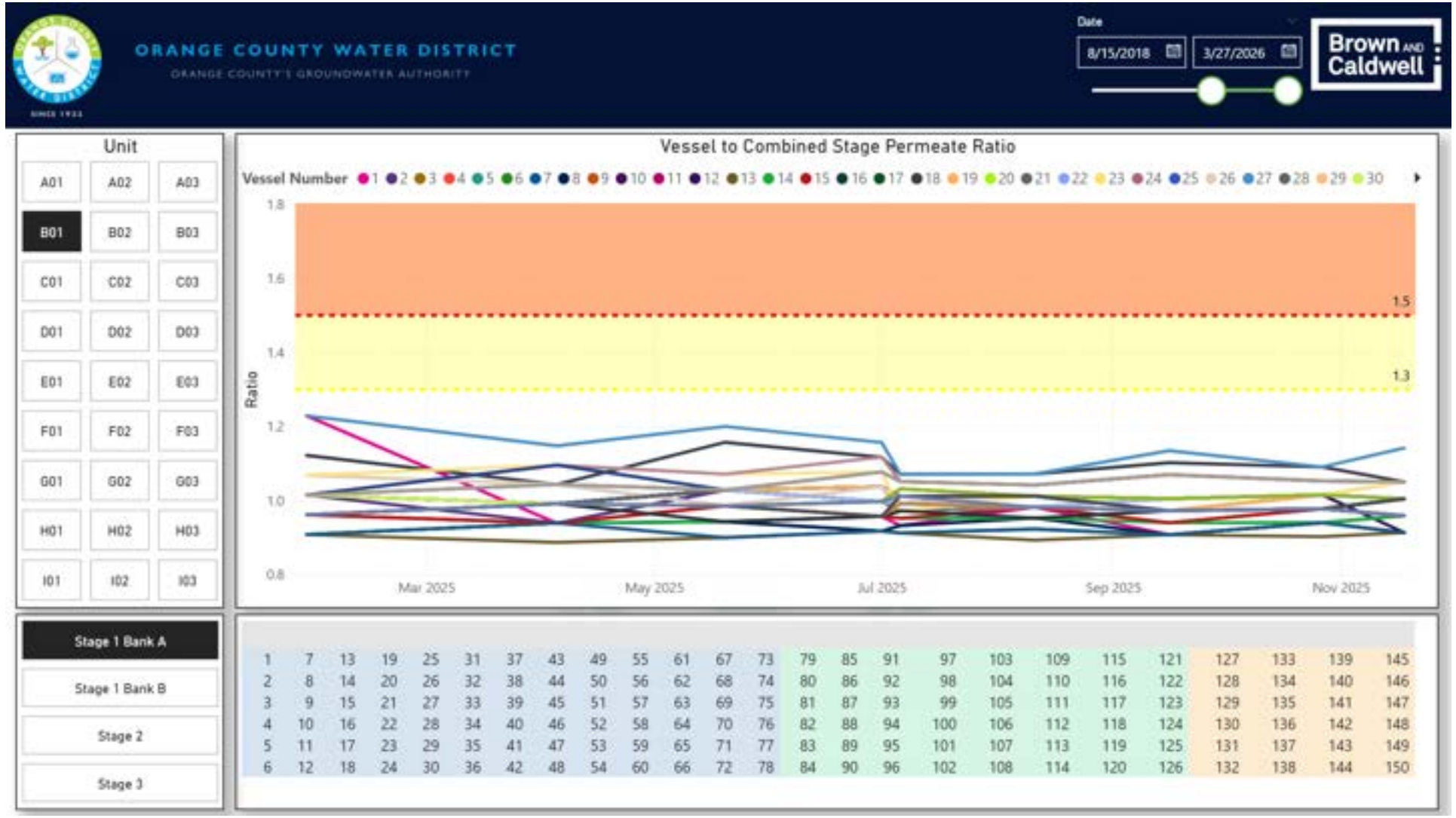


Newly Developed Visualization Concepts

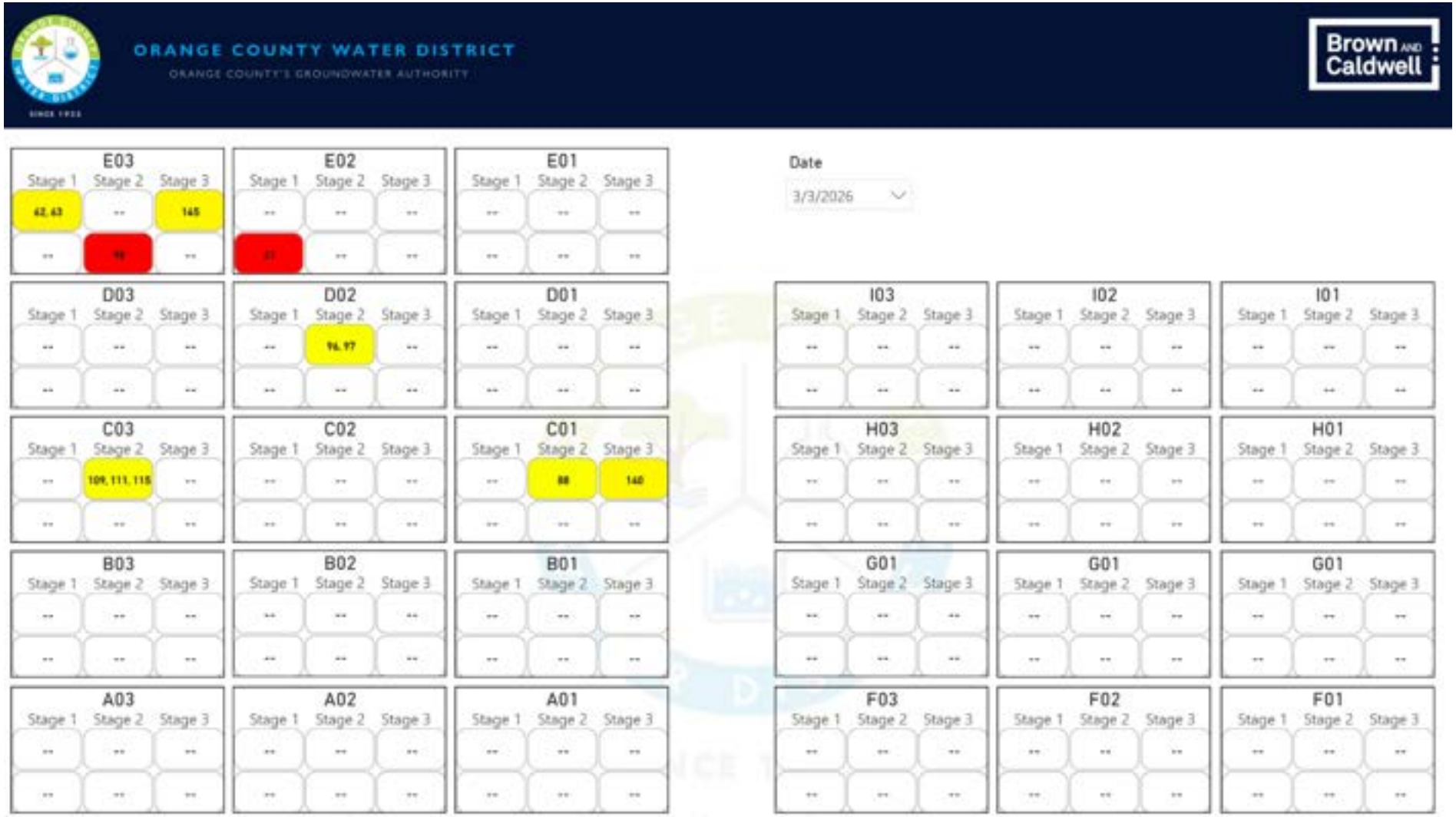
Conductivity Profiles “calculated” LRVs – Integrity



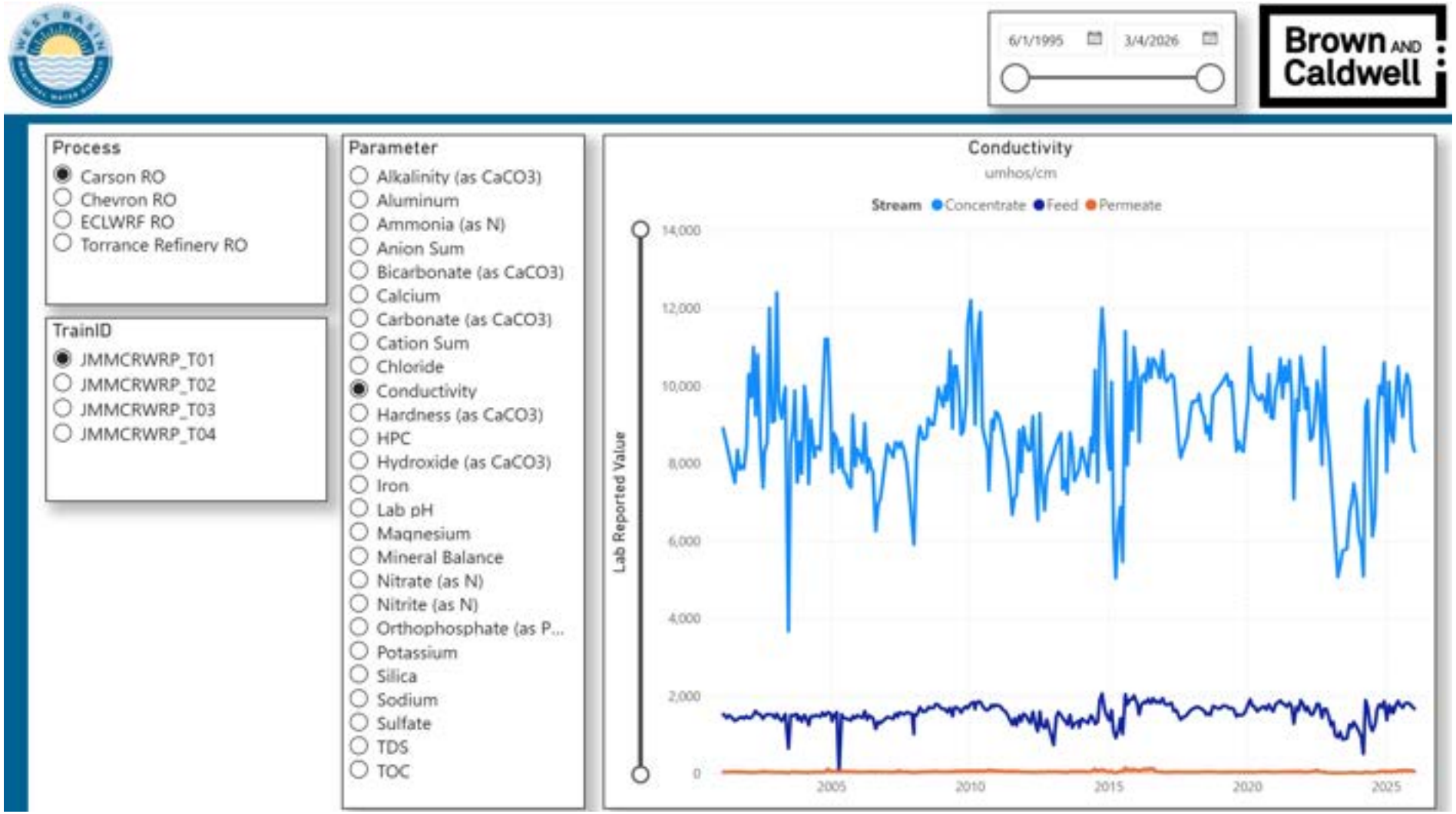
Conductivity Profiles expressed Vessel Ratio – Integrity History



A facility overview of vessels with outliers was recently developed



Trending of Water Quality Data is possible



Final Thoughts

- Data Management is a key component of facility operation.
- Our ability to generate data far exceeds our ability to review/analyze.
- Operational Support is more effective when visuals replace numbers.
- Make available to all (operators and management) the same information that would be needed by a specialist to make a decision.
- We are evolving from a “review of data” to “predictive” data management.
- Operational Data Needs are different than Compliance Data Needs.
- Visualization Platforms such as Power BI have the ability to transform our approach to data management and replace legacy spreadsheets / reports or commercial data display platforms such as Hach WIMS.
- Any decision made or not made has the potential for significant financial impact.
- A properly implemented data management approach is an optimization strategy that will pay for itself many times over.





“A battleship does not turn on a dime”
– Bill Dunivin

Thank you.

Questions?

jvickers@brwncald.com

Brown AND Caldwell


Brown AND
Caldwell

August 11, 2026

A Journey Towards More Straightforward IPR Treatment Validation and Regulatory Compliance



Jason Dadakis,
Orange County Water District & CalVal PI

Outline

- Background & Motivation
- Past - CalVal Phase 1 (completed)
- Present - CalVal Phase 2 (ongoing)
- Future - CalVal Phase 3+
- Q&A



The Status Quo:

Customized Permitting & Compliance Solutions *for Every California Potable Reuse Project are…*

- **Complex**. Seeking or modifying pathogen LRV credits for each treatment technology is time-consuming
- **Expensive**. Delayed projects increase costs and prolong realization of societal and environmental benefits

Is there a better way?



CalVal is…

- A **collaboration** among regulators and the water reuse industry.
- An initiative to develop **standardized** guidance for IPR treatment technologies for California.
- An **opportunity** to design, permit, and operate potable reuse projects with greater confidence.



Driving Factors

Interest in IPR and DPR projects

- More than 40 reuse projects in varying stages of approval

CA Water Recycling Goals

- 800,000 AF by 2030
- 1.8 million AF by 2040

Regulatory benefit

- Establishing consistent approaches for well-established treatment processes will maximize limited staff time during the review process



Project Partners

























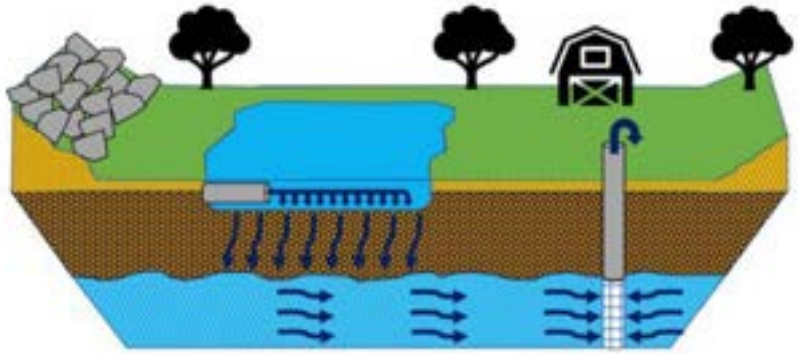




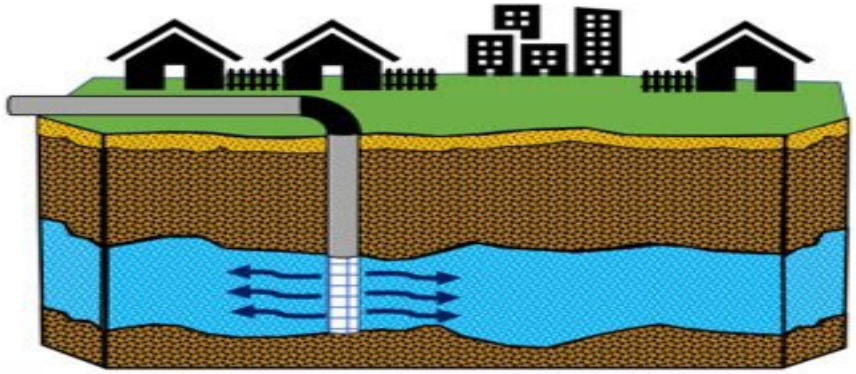
CalVal

CalVal is currently focused on IPR Guidance

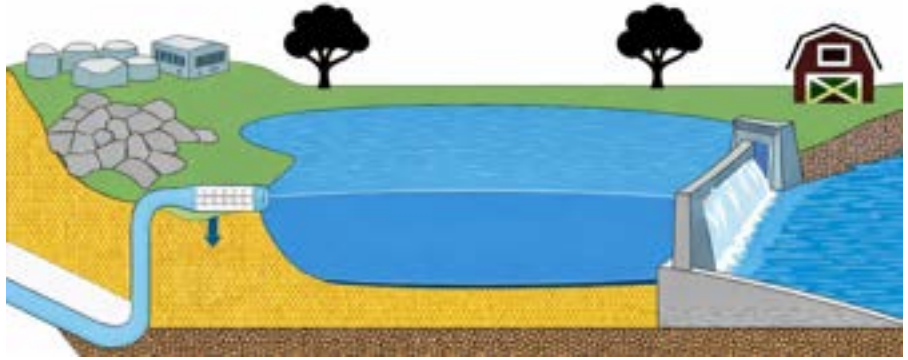
Groundwater Replenishment: Surface Spreading



Groundwater Replenishment: Subsurface Application



Surface Water Augmentation

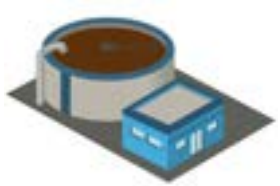


CalVal Phase 1 – WRF Project # 5277

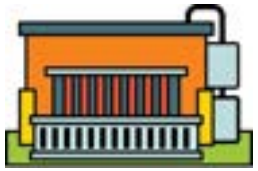
Survey of 13 Conditionally Accepted IPR Projects

Treatment Barriers Reviewed

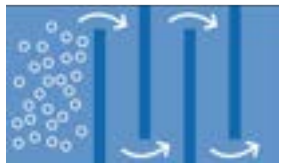
Wastewater Treatment



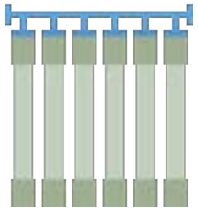
Membrane Bioreactor



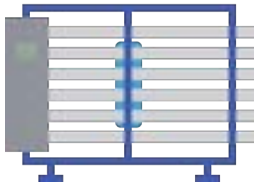
Ozone



Membrane Filtration



Reverse Osmosis



UV AOP



Free Chlorine



Underground Retention Time



Soil Aquifer Treatment



Reservoir Dilution

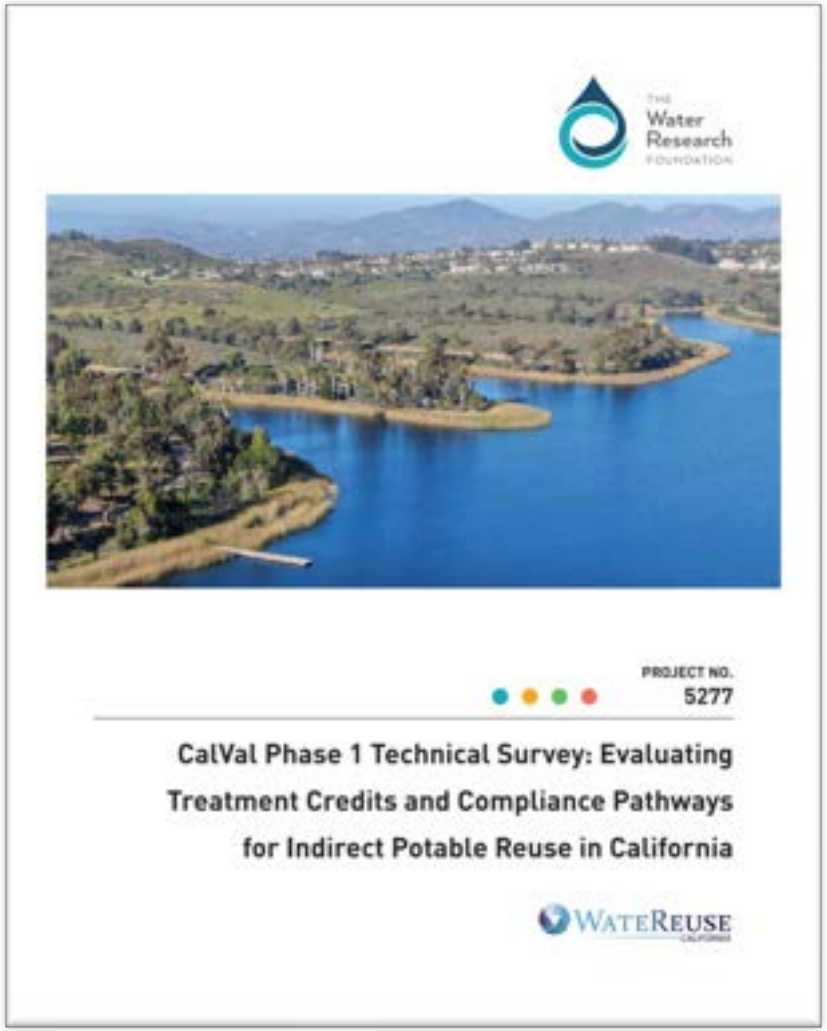


Phase 1 confirmed need for reuse-focused guidance documents

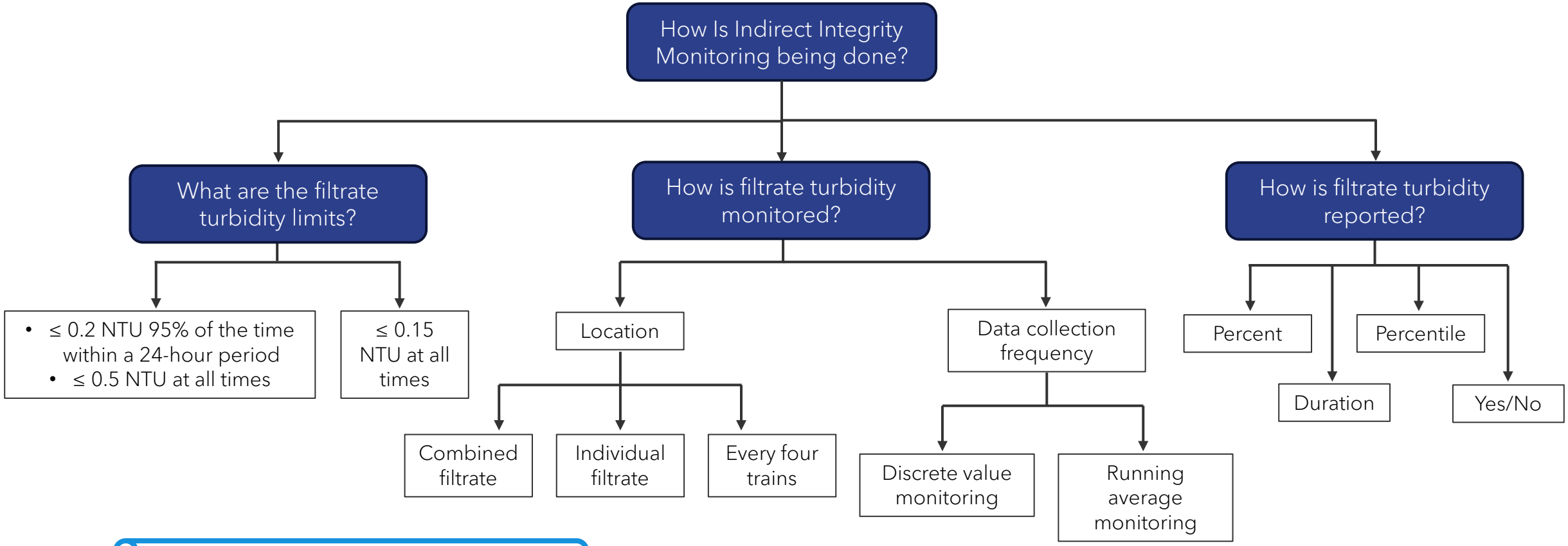
Approval approaches varied in:

- LRV crediting
- CCP monitoring limits and configurations
- Data management
- CCP alarm delay times
- Automated responses
- Reporting

and often relied on drinking water guidance, historical documents, and site-specific data.



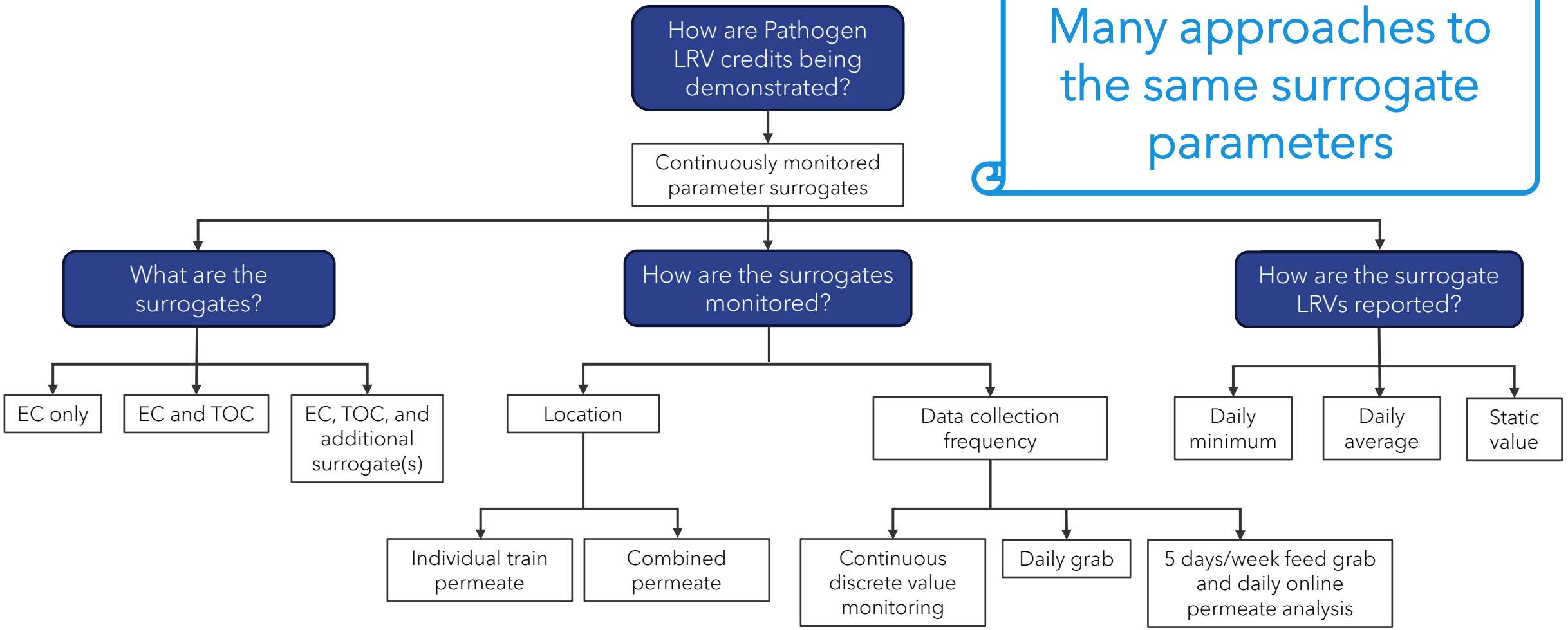
CalVal Phase 1 Findings: Membrane Filtration



One parameter, many approaches!

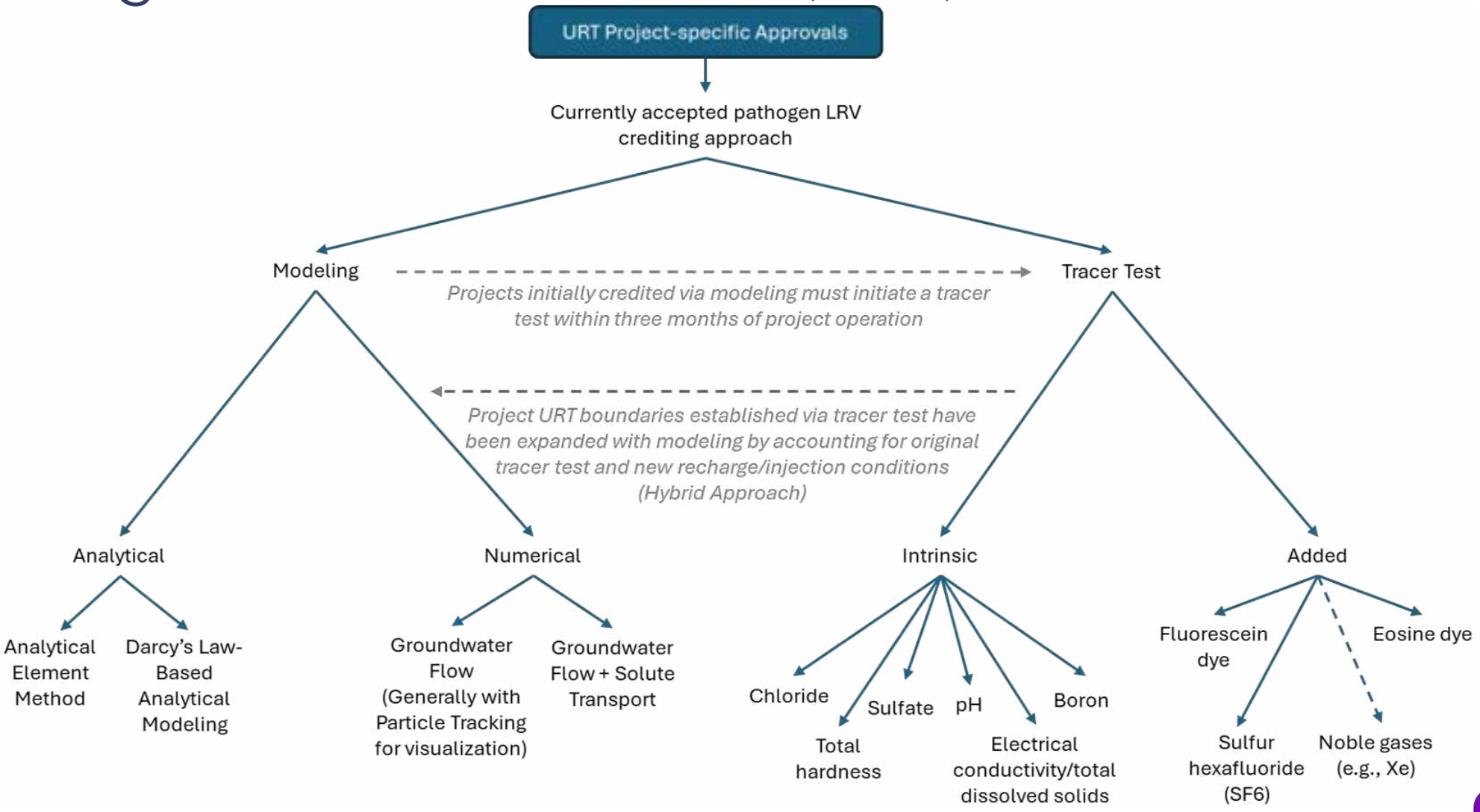


CalVal Phase 1 Findings: Reverse Osmosis



Many approaches to the same surrogate parameters

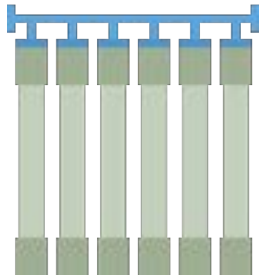
CalVal Phase 1 Findings:
Underground Retention Time (URT)



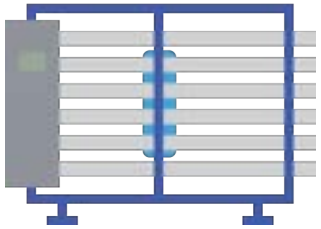
CalVal Phase II

Developing guidance for three core CA IPR Technologies

Membrane Filtration



Reverse Osmosis

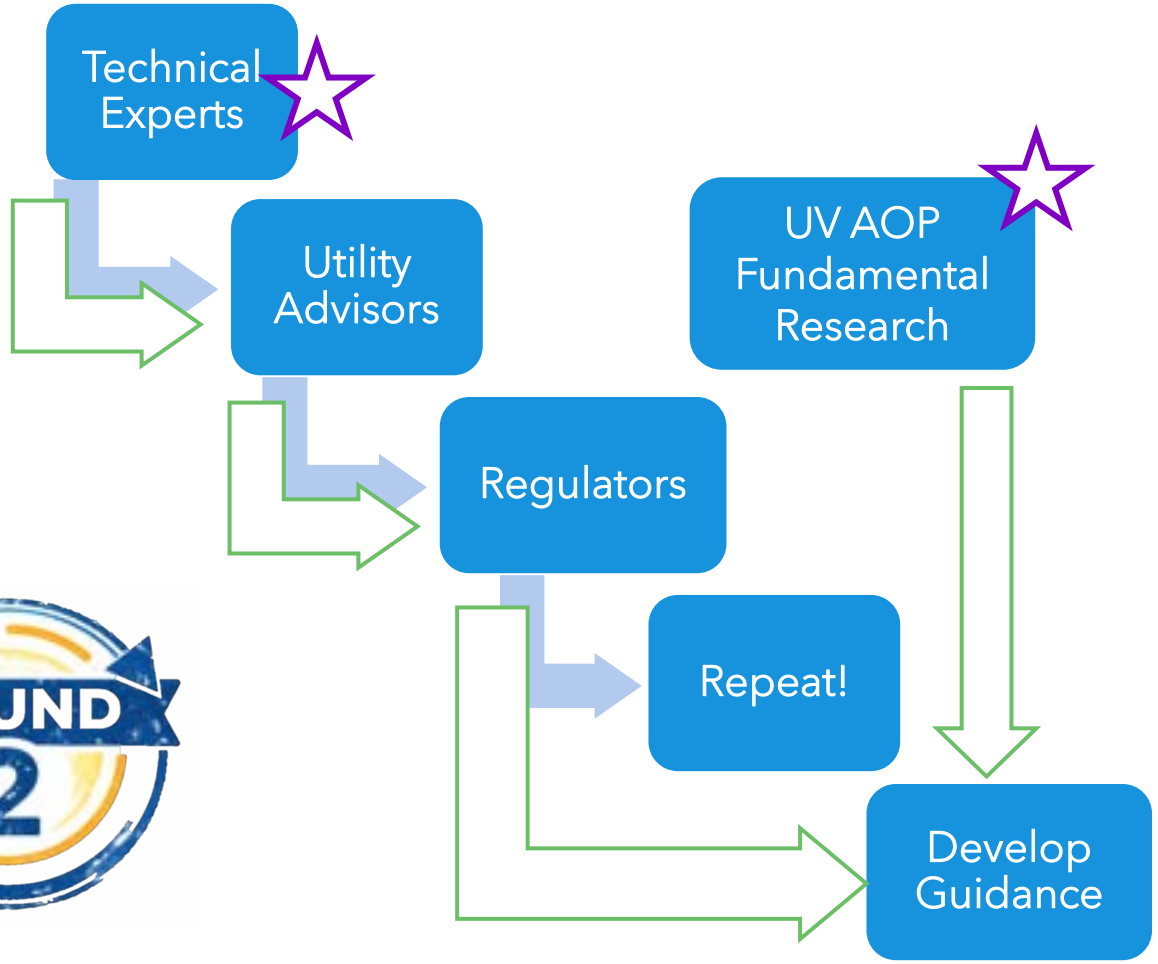


UV AOP



- Pathogen LRVs are a primary focus of CalVal guidance
- Guidance will include design, operations, and regulatory reporting
- DDW-accepted final guidance documents anticipated by the Q3 2027

Phase II guidance is developed through CalVal's collaborative and iterative process



Consensus-based guidance is developed through iterative engagement among experts, utilities, regulators, and research teams



☆ We are here

CalVal

Technical Expert Meetings

Ensure guidance is justified by best science

MF/UF

Broad support for continuously monitoring individual MF unit filtrate turbidity at 5-min intervals

RO

- Routine conductivity profiles support performance verification & potential for higher pathogen LRVs
- Surrogate monitoring differs for regulatory compliance and operational performance

UV AOP

UVDGM-validated reactors are recommended for IPR projects going forward, with additional guidance for projects that want to pursue alternative options.





Over 300+ years of combined design experience

Utility Advisor Meetings

Ensure guidance is practical to implement

MF/UF

- Credit actual LRVs from daily PDT results, not pass/fail
- Limitations of turbidity monitoring
- Reprogramming SCADA & PCS is non-trivial

RO

- Validity of monitoring bulk combined permeate with higher sensitivity surrogates (e.g., TOC, Sr)
- Challenge of rapid turnaround of Sr lab analysis; online Sr monitoring is expensive and still maturing

UV AOP

Support for distinguishing between UV dose monitoring setpoints for pathogen and chemical control





Representing over 250 MGD of planned, constructed, and operational IPR projects

Regulator Workshop

CalVal alignment with regulators' perspectives

MF/UF

What filtrate turbidity limit(s) and monitoring locations are most relevant for indirect integrity monitoring?

RO

What monitoring frequencies and locations are appropriate for pathogen LRV surrogates?

UV AOP

How can we validate that UV reactors achieve 6-log pathogen LRVs?



Water Boards

State Water Resources Control Board

March 7, 2025

Kevin Hardy
Executive Director
National Water Research Institute

Dr. Shane Trussell
President
Trussell Technologies

Via email:

Dear Mr. Hardy and Dr. Trussell,



CDPH Offices, Richmond: January 2026

25+ participating DDW and DWQ staff

UV AOP Guidance Required Additional Research via bench and pilot testing

1. Assess feasibility of MS2 spot check bioassays
2. Compare NDMA dose response using collimated beam and pilot reactor
3. Measure background scavenging demand using two different labs
4. Inform UV AOP monitoring and 1,4-dioxane challenge testing guidance
5. Evaluate breakpoint chemistry in UV/chlorine processes

Assessed across three sites from Feb – July 2026

ORANGE COUNTY WATER DISTRICT

G | W | R | S

GROUNDWATER REPLENISHMENT SYSTEM

The City of SAN DIEGO

Pure Water San Diego

Monterey One Water

Pure Water Monterey

CalVal

UV AOP Research Behind the Scenes











Look Ahead

- Analyzing pilot results from UV AOP research
- Complete Workshops Round No. 2 this year! (3 of 7 remain)
  - UV AOP Technical Experts #2 – Sept 17 hosted by City of San Diego
  - UV AOP Utility Advisors #2 – Oct 21 hosted by OC Sanitation District
  - Regulatory Workshop #2 – Nov 18-19 in San Diego
- Have begun initial drafting of MF and RO guidance
- Draft guidance for MF, RO, and UV AOP to be completed by July 2027 (Phase 2 completion)



CalVal

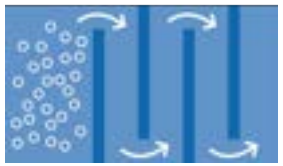
Planned Future CalVal Guidance Modules

Phase III (2027-2029)

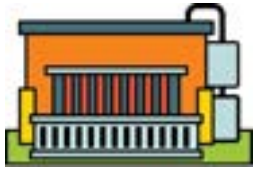
Free Chlorine



Ozone



Membrane Bioreactor



Underground Retention Time



Phase IV (2030-2032)

Wastewater Treatment



BAC



Soil Aquifer Treatment



Reservoir Dilution



Required funding exceeds $11 million

CalVal

2026 WateReuse CA CONFERENCE SAN FRANCISCO

Building Blocks for International Scientific Consensus on Purified Recycled Water Treatment Barrier Validation

Moderator
Kevin M. Hardy, Executive Director
National Water Research Institute

Panelists
Andrew Salveson, PE, Carollo Engineers
Shane Trussell, PhD, PE, Trussell Technologies
Stuart Khan, PhD, University of Syndey, Australia
Jing Chao, PE, California Division of Drinking Water

August 24, 2026
Monday 2:00–3:30 PM

NWRI
NATIONAL WATER RESEARCH INSTITUTE

CalVal

Thank you! Questions?



LOS ANGELES COUNTY
SANITATION DISTRICTS
Converting Waste Into Resources

WateReuse Legislative Update, LA Chapter

Phillip Vander Klay

Legislative Liaison, LACSD

August 11, 2026



Federal Update

FY 2027 Budget

- Drinking Water authorization $4 billion
- Clean Water authorization $3.5 billion
- WIFIA $65 million
- CR until after midterms


Lame Duck

Proposed Grant Regulations

- 2 CFR 200
- Political appointees decide grants
- Grants can be stopped mid-term
- Administration can change priorites
- Administrations can change




Lame Duck

(Maybe) Turning on the Taps

- MORE Water Act and Large-Scale WR bills passed Senate committee
- WRDA ongoing
- Reconciliation 2.0 and 3.0 - Iran War money
- President approval dropping below assumed floor
- Midterms are coming




Lame Duck



The 2026 Legislative Session

- Last month of session
- AI – Water, energy, people, & products
- AB 2777 (ESTM) SRF variable loan rates
- $78 million in Recycled Water funds from Prop 4

LOS ANGELES COUNTY
SANITATION DISTRICTS
Converting Waste Into Resources

Questions?

Phillip Vander Klay

phillipvanderklay@lacsd.org

(562) 783-1965



Chapter Trustee Updates
WateReuse LA Chapter – August 11, 2026

Last Board of Trustees Meeting: April 24, 2026

What's ahead

2026 WateReuse California Annual Conference

Hyatt Regency San Francisco Embarcadero Center

August 24 – 26, 2026

What to Expect

- 800+ water reuse professionals expected
- 10 Panels + 108 Technical Presentations
- Keynote: Tammie Jo Shults — U.S. Navy F/A-18 pilot & captain of Southwest Flight 1380
- NEW: Reuse Rumble (team-based operator skills competition)

How to engage this quarter

Register for the Conference
watereuse.org / WRCA Annual Conference

Book your room
$279/night discount rate — Hyatt Regency SF

Sponsor the Conference
Contact Brian Ray, bray@watereuse.org

LA Chapter Updates

- Communications Chair: *Oliver Slosser* *oslosser@lvmwd.com*
- Ad Hoc Urban Irrigation Manual Update Co-Chairs: *Monica Sanchez and Erika Bensch* *monicasanchez@lacsd.org*
- *Rising Professionals Committee Chair: Wen Cong* *wenc@trusselltech.com*
- Technical Topics Chair: **VACANT**

WATEREUSE LOS ANGELES


SMOG CITY
Brewing Co.
WATEREUSE
LOS ANGELES

Tuesday, August 11, 2026
Metropolitan Water District of Southern California

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